The Builder.

VOL. XV.—No. 730.

THE Clock Tower of the new Palace, Westminster, is now approaching completion; the clock-faces are about to be fixed; and, when the four quarter bells are cast, "Big Ben" will be raised to his destination, and the clock will be brought from Mr. Dent's manufactory, at Millbank, where it has been going a long while, and will tell, far and wide, not merely "the time o'day," but the time o'night. Following up the extensive series of illustrations of Sir Charles Barry's great work which has already appeared in our pages, we have thought this the right moment to give a section of the upper part of the tower, and a view of a portion of it, the latter on a sufficiently large scale (8 feet to 1 inch), to show the details clearly.*

The clock tower is situated at the north-west angle of the Palace, adjoining Westminster-bridge: three of its sides are disengaged from the ground to the top, and the fourth is connected with the buildings on the east side of New Palace-yard, which contain the residences of the officers of the House of Commons. The west side is not yet finished, as it is proposed that the new buildings, designed by the architect to enclose Palace-yard, and to complete the new palace on that side, should adjoin it. The walls of the tower, 3 feet 6 inches in thickness, are built of brick, with a facing of Anston stone. The clock-face is of cast-iron, filled in with a new description of white semi-opaque glass, supplied by Gardner, of the Strand. The dial, which is 22 feet 6 inches in diameter, will appear entirely opaque by day, it is hoped, but will, nevertheless, be available for illumination by night. The clock hands will be of copper, made as light as is consistent with the requisite strength to resist the action of the wind. The clock and bells, as every one now knows, have been constructed under the superintendence of Mr. E. B. Denison, Q.C. with whom Professor Airy was, only for a short time, associated. Let us first, however, confine ourselves to the structure.

The roof of the tower is of cast-iron, galvanized, and the ornaments upon it are for the most part of the same material. The finial is of wrought copper, and is gilt, as are also the various crockets and other ornamental details. The whole weight of the metal roof is about 300 tons. The lower part of the tower contains eleven stories of rooms, which are appropriated to various purposes, and include a prison for refractory members of the House of Commons, and others who may incur the Speaker's august displeasure. Those who are incarcerated will have the advantage, at any rate, of being able to count the hours of their captivity. The upper part of the tower is entirely devoted to the clock, bells, and lighting chamber, to which there is a separate staircase, enabling visitors to ascend to the lantern in the middle of the roof. The external width of the tower, which is square, is 35 feet (exclusive of buttresses), and its total height from the ground to the top of the finial is 310 feet. The foundations are formed of concrete, about 15 feet thick, the upper surface of which is 14 feet below the ground. The two lowest footings are formed of stone landings, 6 inches thick, the area of the lowest of which is 1,846 feet, upon which it is calculated there is a pressure of rather more than 4¼ tons per foot, exclusive of the weight of the roof, clock, and bells. The building was erected by Mr. Grissell, up to the corbel course under the clock story, and the portion from that level to the eaves of the roof by Mr. John Jay, the present contractor at the New Palace. The iron roof has been constructed by Mr. Jabez James, and the ornamental metal-work, partly by James and partly by Hardman of Birmingham. The gilding is principally by Mr. Crace, and the stone carving, like all the carving at the Palace, has been carried out under Mr. Thomas.

The great bell, of which we have before spoken, and which is nearly 16 tons in weight, is now hung temporarily at the foot of the tower, and will be hoisted to its place as soon as the four quarter-bells, and the necessary iron-work for fixing them, are prepared. All the bells will be raised by the shaft, up which the whole of the materials used in the tower have been lifted. Our readers will remember a cry raised some time since, that the architect had forgotten to provide for hoisting the bells, and that an external scaffold would consequently be required, at we know not what expense: we need hardly say how groundless was such a silly assertion, or how little such a state of affairs would have been in accordance with the evident care and forethought bestowed by the architect on every portion of his immense work, at this time so rapidly approaching completion.

Let us now give some particulars of the Clock, referring to Mr. Denison's own description of it, in the eighth edition of the "Encyclopædia Britannica." The four dials, as we have said, are to be 22 feet each in diameter, the largest, it is believed, in the world with a minute-hand: the larger dials on the Continent have only an hour-hand. The minute-hand, on account of its greater length, velocity, weight, friction, and the action of the wind upon it, requires at least twenty times as much force to drive it as the hour-hand. The effects of friction and wind with such hands as these offer difficulties in the way of the clock going even as well as an ordinary church clock; to overcome which, what is called remontoire work is used, part of the arrangement being for the purpose of giving a visible motion of the hands at every half-minute, when the point of the minute-hand will move nearly 7 inches.

The great wheel of the going part is 27 inches in diameter: the pendulum is 15 feet long, and weighs 680 lbs.; and the scape-wheel, which is driven by the musical-box spring on the third wheel, weighs about half an ounce. All the wheels, except the scape-wheel, are of cast iron, *i.e.* with the teeth cast, not cut, and all have five spokes. The barrel is 23 inches diameter, but only 14 inches long, as this part will not require a rope above ¼ inch thick, and 55 turns in the 8½ days, for which that part is to be capable of going, though the striking parts go only 7½ days, so that in case of an accidental omission to wind it up on the proper day, the clock may not stop, but proclaim the neglect by silence. The second wheel is 12 inches in diameter, with a lantern pinion of 12, driven by 180 teeth on the great wheel: it has 120 teeth, and drives the pinion of the spring remontoire and the fly. The size of the hour-bell fixes the size of the striking parts; for that determines the weight of the hammer, which was proposed to be not less than 4 cwt. according to the usual proportion, with a rise of at least a foot, but must now be 12 cwt. The striking cams are eighteen in number, cast on a wheel of 37 inches in diameter.

There is to be a contrivance for stopping the winding when the clock is going to strike, as the winding of each of the striking parts will probably take two hours. The second wheels are a little more than 18 inches in diameter. The second train wheel in each striking part drives a bevelled wheel, which drives the fly above the clock on a vertical arbor, as in the Exchange clock, in order to keep it out of the way of people winding or examining the clock. The great wheels all have 180 teeth: the second wheel of the hour-striking part has 105, and a pinion of 15, so that it turns two-thirds round at each blow, and the lifting cylinder upon its arbor has three segments cut out of it, and two of them are passed at each blow,—probably a novel arrangement, but thought the most convenient here with reference to the numbers of the teeth. The great wheels are 38⅓ inches in diameter, and the whole mass of the barrel, great wheels, and cam wheels, weighs no less than 17 cwt. The whole of the wheels, except the fly wheels and winding pinions, lie on the top of the great frame, which is a trussed girder frame 19 inches deep (like the girders of the Crystal Palace), resting on two walls 11 feet apart, which come right up from the bottom of the tower. The frame will be 15½ feet long: the striking pulleys will be about 2½ feet in diameter, and pivotted in. Mr. Denison adds, with reference to the question of the strength of cast-iron teeth, that a segment of one of these great wheels was tried up to breaking point, and it bore a pressure of six tons, and then only broke from the pinion not bearing quite flat upon it.

The desirability of employing cast-iron wheels is questioned, as our readers know, by some who are well informed on the subject, but into this we do not propose to enter.*

There are several matters in connection with the clock and bells as yet undetermined, and the position of the bells shown in the section may not be adhered to. For illuminating the dials, we understand electricity will probably be used. The art of illuminating dials is not yet in a quite settled state, and we shall be prepared to find that time will be needed to make the Westminster clock satisfactory in this respect. Some communications on the subject in a former volume of our journal may be usefully referred to. Dials illuminated from within in the ordinary manner always look very ill by day, when they are more seen and more wanted. As noted in the Encyclopædia article already referred to,—"Another objection to illuminating large dials from the inside is, that it makes it impossible to counterpoise the hands outside, unless, perhaps, the counterpoises could be made of glass. And if they are only counterpoised inside, there is no counterpoise at all to the force of the wind, which is then constantly tending to loosen them on the arbor, and that tendency is aggravated by the hand itself pressing on the arbor one way as it ascends, and the other as it descends; and if it once gets in the smallest degree loose, it becomes rapidly worse by the constant shaking. It is mentioned in Reid's book, that the minute-hand of St. Paul's Cathedral, which is above 8 feet long, used to fall over above a minute as it passed from the left to the right side of XII, before it was counterpoised outside." In the conditions to be followed in the Westminster clock, it is expressly required that "the hands be counterpoised externally, for wind as well as weight"—a very necessary precaution.

Some few notes on the introduction and early employment of clocks, may prove interesting.

Various inventions for the measurement of time were in early use. Mention is made in the Bible of an instrument to show the passing hours. In the reign of Hezekiah, king of Judah, the king refers to the dial of Ahaz, his father, who died about 726 years before the Christian era. In the year of Rome 595 (157 years B.C.), a water clock was erected by

* See pp. 62 and 63.

* We have received a long letter from Mr Loseby in reply to Mr. Denison's last, but cannot find space for it. The writer asserts, with reference to the weight of the clapper, "that 120 lbs. for the hammer, and 6 inches for the fall, is the greatest quantity of work the clock should be allowed to do."

Scipio, and, acting in all weathers, and at night as well as day, it was of the utmost utility and importance. Pacificus, archdeacon of Verona, who lived in the ninth century, is said to have been the inventor of clocks worked by wheels. It is by some, however, strongly contested that the credit of the invention is due to Boethius, who is said to have made the discovery about the year 510.

Mr. Bowle, in the "Archæologia," vol. vii. p. 218, remarks, "That clockmaking was brought to such a degree of perfection at the end of the thirteenth, or very early in the fourteenth century, that small house-clocks, nay, probably table-clocks, were then in use, seems apparent from what follows :—

'Et puis fait sonner ses orloges,
Par ses salles et par ses loges,
*A roes** trop subtillement,
De pardurable movement.'
Roman de la Rose."

This passage indicates good and serviceable workmanship, and the modern edition tells us that the poem was finished before 1305.

Although it appears to be a matter of uncertainty at what period large clocks, now so familiar to every one, began to supersede the sun and moon dials, tapers, and other measures of time, we find certain accounts of clocks mechanically constructed in England at a remote date. In 1288 a stout stone clock-tower was erected opposite to Westminster Hall, out of a fine of 800 marks imposed upon Ralph de Hengham, Chief Justice of the King's Bench, in the 16th year of Edward I. In this belfry tower, which was still standing in 1715, was a clock which struck the great bell called Tom of Westminster, so as to be heard by the people (judges as well as others) in the courts of law. This clock was kept in use until the time of Queen Elizabeth, when it was reconstructed. A clock was also put up in Canterbury cathedral, in 1292, at a cost of 30*l.* In 1308 three Dutchmen, who were *orlogiers*, obtained the protection of Edward III. Chaucer, the poet, who lived in the fourteenth century, when he speaks of a cock's crowing, says :—

"Full sikerer was his crowing in his loge,
Than is a *clok* or any abbey orloge."

In the reign of Queen Elizabeth the use of clocks had become familiar. Shakspeare refers to them in the following instances :—

"They'll tell the clock to any."—*Tempest*, act ii. sc. 1.

"Vat is de clock, Jack?"—*Merry Wives of Windsor*, act ii. sc. 3.

"The clock gives me my cue."—*Merry Wives of Windsor*, act iii. sc. 2.

"The clock upbraids me with."—*Twelfth Night*, act iii. sc. 1.

"To-morrow, four o'clock."—*Measure for Measure*, act iv. sc. 2.

"Like a German clock, still a repairing."—*Love's Labour's Lost*, act iii. sc. 1.

"Larks are ploughmen's clocks."—*Love's Labour's Lost*, act v. song.

"At the farthest by five of the clock."—*Merchant of Venice*, act ii. sc. 2.

"Ever run before the clock."—*Merchant of Venice*, act ii. sc. 6.

"There's no clock in the forest."—*As You Like It*, act iii. sc. 2.

"Of time as well as a clock."—*As You Like It*, act iii. sc. 2.

"And his honour, clock to itself, knew."—*All's Well that Ends Well*, act i. sc. 2.

"I love thee not a jar o' the clock behind."—*Winter's Tale*, act i. sc. 2.

"Wishing clocks more swift."—*Winter's Tale*, act i. sc. 2.

"The clock has strucken twelve."—*Comedy of Errors*, act i. sc. 2.

"Should be your clock and strike you."—*Comedy of Errors*, act i. sc. 2.

"And now the clock strikes one."—*Comedy of Errors*, act iv. sc. 2.

"By the clock 'tis day."—*Macbeth*, act ii. sc. 4.

"I have not heard the clock."—*Macbeth*, act ii. sc. 1.

"Time made me his numbering clock."—*Richard II.* act v. sc. 5.

"His Jack o' the clock."—*Richard II.* act v. sc. 5.

"And clocks the tongues of bawds."—*First Part of Henry IV.* act i. sc. 2.

"Fought a long hour by Shrewsbury clock."—*First Part of Henry IV.* act v. sc. 4.

"About three of the clock."—*Second Part of Henry IV.* act i. sc. 2.

"The clocks do toll, and the third hour."—*Henry V.* act iv. Chorus.

"Like clocks, still to strike on."—*First Part of Henry VI.* act i. sc. 2.

"It's nine o'clock."—*Richard III.* act v. sc. 3.

"Count the clock; the clock hath."—*Julius Cæsar*, act ii. sc. 1.

"Canst awake by four o' the clock."—*Cymbeline*, act ii. sc. 2.

"The sands that run i' the clock's behalf."—*Cymbeline*, act iii. sc. 2.

"To weep 'twixt clock and clock."—*Cymbeline*, act iii. sc. 4.

"Upon a time, unhappy was the clock."—*Cymbeline*, act v. sc. 5.

"The clock struck nine when."—*Romeo and Juliet*, act ii. sc. 5.

"Old time the clock-setter."—*King John*, act iii. sc. 1.

Shakspeare makes mention, in *Love's Labour's Lost*, of clocks of German manufacture, nor is he the only one of the contemporary dramatists who alludes to these productions. In Ben Jonson's *Silent Woman*, first acted in 1609, he says :—"She takes herself asunder still when she goes to bed into some twenty boxes, and about next day noon is put together again, like a great German clock, and so comes forth and rings a tedious larum to the whole house, and then is quiet again for an hour, but for her quarters."

At or near the year 1340, Dufydd ap Gwilym, the celebrated Welsh Ovid, abuses a clock for disturbing him during a delicious dream, and thus, as Captain, now Admiral Smyth translates in his elaborate memoir in the Archæologia, he perorates :—"Confusion to the black-faced clock by the side of the bank, that awoke me! May its head, its tongue, its pair of ropes, and its wheel moulder; likewise its weights of dullard balls, its orifices, its hammer, its ducks quacking, as if anticipating day, and its ever restless works! This turbulent clock clacks ridiculous sounds, like to a drunken cobbler, a cobbler, too, in appearance, cunning and false blindgut! the yelping of a dog in a pan echoed! the ceaseless chatter of a cloister! a gloomy mill grinding away the night!"

Froissart, in one of his earliest productions ("Horloge Amoureuse"), says :—

"The clock is, if considered truly,
An instrument very fair and very notable,
And it is also agreeable and profitable;
For night and day it teaches us the hours,
By the subtility which it comprises,
In the absence even of the sun;
On which account we should the more prize its construction,
Which the other instruments do not,
However they may be made by art and by compass;
Therefore I hold him for valiant and wise,
Who first found the use of it,
When by his sense he began and made
A thing so noble and of such great profit.
* * * * *
I will now talk of the state of the clock."

The poet then gives a long account of its complicated machinery.

Leland mentions a famous astronomical clock, made by Richard Wallingford, the son of a smith, who for his learning and ingenuity became Abbot of St. Albans in the reign of Richard II. This clock continued to go in Leland's time, who was born at the latter end of Henry VII.'s reign, and who speaks of a tradition, that this famous piece of mechanism was called Albion by the inventor.

Dante, who was born in 1265, and died in 1321, mentions an *orologio*, which struck the hour.

The great clock at Paris was put up in the year 1364, during the reign of Charles V. having been made by Henry de Wic, a German.

The oldest clock, of English manufacture, extant, is perhaps that which was made about A.D. 1340, by Peter Lightfoot, a monk of Glastonbury, for Adam de Sudbury, his abbot. The face of this machine is divided into twenty-four hours, in two divisions of twelve hours each, and it showed time, lunar and solar movements, and four knights on horseback, tilting in rapid circumvolutions. After the dissolution of the abbey it was removed from Glastonbury to the Cathedral at Wells, and still remains in an old chapel in the north transept; but the works were so completely worn out, that about 1835 they were replaced by a new train, made by Messrs. Read and Thwaites, the long-established Clerkenwell firm. The curious original face or dial-plate, and the antique equestrian figures, were carefully adapted to new bodies, and are still in use.

We could give other accounts of old English clocks, but will on to the time when the increased skill of the workman enabled them to construct the machinery on such a small scale as to produce pocket clocks or watches. It is evident that, in order to construct them, a new moving power was required as a substitute for the weights which set in motion the wheelwork of the fixed clocks: it was necessary that this power should act of itself, independently of external forms and irrespective of position, and that the source of it should be compact. Such a power is found in the expansive force of a coiled spring; and it appears that it was not until the end of the fifteenth century that this improvement was effected, at which time clocks had become of general use in the houses of the wealthy.

"The best and most portable," says Admiral Smyth, to whose memoirs in the Archæologia we have been mainly indebted, "as well as the most general in shape, is the celebrated clock belonging to the Queen, which is the actual one presented to the fair, accomplished, and unfortunate Anne Boleyne on their marriage in November 1532. Her Majesty graciously permitted me to examine this interesting horological relic at Windsor Castle, with leave to handle the works. It is now placed on an ornamental bracket at the foot of the staircase leading to the Queen's closet, generally known as the 'Panel-room,' where it will probably show the taste of the sixteenth century for many ages. On taking it down from the bracket with my friend Mr. John Hulbert Glover, her Majesty's zealous librarian, I regretted to find that this valuable machine had been 'done up,' as the tampering with ingenious works is often too truly termed. The interior wheels are now all of brass, and the whole train is evidently of comparatively recent date; while, from the style of the mechanism, a contrate wheel being used to keep the arbors of the others horizontal, and the adaptation for a pendulum, an inference may be gathered that the 'doing up' took place about the year 1680."

"It is not only her Majesty's clock which has thus been altered, but almost all the specimens I have seen of the reigns of Elizabeth, James I. and Charles I. have had the balance removed and the pendulum applied, and the innovation is so meritorious that even an antiquary must excuse it."

In the 3rd of James I. a watch was found upon Guy Fawkes which he and Percy had bought the day before, "to try conclusions for the long and short burning of the touchwood with which he had prepared to give fire to the train of powder."

In 1631 Charles I. incorporated the clockmakers, and the charter prohibits clocks, watches, and alarums from being imported. About the middle of the seventeenth century, Huygens made his great improvement in clockwork, which produced many others from our own countrymen, the latest of which was the introduction of repeating watches in the time of Charles II. This king was very curious with regard to these time-measurers, and it is said that watchmakers (particularly East), used to attend whilst he was playing at the Mall, a watch being often the stake.

Charles V. of France was so much pleased with time-measurers, that he used to sit after his dinner with several of them on the table, his bottle being in the centre; and when he retired to the monastery of St. Just, he continued to amuse himself by keeping them in order, which is said to have produced a reflection from him on the absurdity of his attempt to regulate the motions of the different powers of Europe.

And so, having ticked our time, we wind up and,—strike.

* *A roes*, or with wheels.

THE UNEMPLOYED WORKMEN.

HOWEVER futile the advice may be which has been tendered, by their so-called friends, to the large body of operatives connected with the building trades now unfortunately out of employ, and however dangerous the doctrine taught by some of their leaders, expressions of sympathy, and earnest endeavours to assist them in their need, should not be withheld. Builders suffered fearfully during the war, especially the class engaged in the erection of houses for sale, and have been suffering since. The *Gazette*, for many months, showed too clearly what was going on; and even at the present time there are no buyers, houses remain on hand, and the interest of money borrowed, together with the ground-rent and law charges, is in some quarters swallowing them up. As a matter of course, workmen have been discharged, as well because of this as of the winter, which necessarily stops building operations, and thus we find a large number of deserving artizans out of employ, and requiring aid. Whether or not the number is so large as has been suspected, we are unable to say: we sincerely hope not. The statements as to the number of persons who attended the second meeting in Smithfield, were certainly much exaggerated. Some of the newspapers called it 16,000; but looking with our own eyes, we were unable at any time while the chairman was speaking to count a thousand. Let us hope, therefore, that the numbers of those who are in distress may be less than has been feared. Taking the best view of it, however, they are unquestionably very numerous, and something should be done to aid them. Emigration has been urged as the most effectual step, and would doubtless be advantageous to many. In the meantime, however, they need assistance, and we should be very glad to see a respectable committee organized to receive subscriptions, and devise some means of giving useful help.

We have received several letters in reply to one signed "T. L. D." in our last, and two or three taking nearly the same view as the writer of it. Of the former, we have printed one of the earliest that reached us, and next week will give attention to others.

IN reference to the want of employment so loudly complained of by many mechanics in the building trade, and in answer to the letter which you publish from "An Architect and Surveyor," in which he exposes the fallacy of applying to the unions for relief, and attributes their present distress principally to their own acts, permit me to say that very many, probably a large majority in the trade to which I belong, whilst agreeing with your correspondent on the absurd and degrading nature of such a course, cannot help feeling that his remarks on the subject of wages and the conduct of trade societies are opposed to truth. He asserts that when wages were lower there was more constant employment than now, which he attributes to the mischievous interference of trade unions, which raise the price of labour to such an extent that employers can only realise a profit on the *material*, and not on the *labour*. In the first place, there are other causes operating to produce such an effect, if it exists at all. With regard to trade societies forcing up wages, there are not more than one-fifth of the men in my trade that belong to them. Nor is it a condition of membership that a man shall receive the highest rate of wages. The employers themselves make a standard rate, by refusing to pay a superior workman more than an ordinary one. As for the logic which says an employer can only get profit on the material, and not on the labour, it needs nothing to prove its absurdity. Were I to compare the remuneration your correspondent receives for his labour with mine, he would probably tell me that the outlay for his education was greater than mine; that it required more study and talent of a higher order to fit him for his profession than are requisite for mine, and, as a necessary consequence, he is justly entitled to a higher remuneration. I grant he is; and by the same rule I maintain that seven years devoted to acquire a business, with a premium paid into the bargain; an expensive lot of tools to provide, subject to constant wear, and loss by fire or robbery; together with the uncertainty of employment,—are sufficient reasons why we should have more pay than policemen. It really is too bad that the working classes should be continually told they receive good wages by those who never knew want, nor how far a workman's wages procure for himself and family the means of support, after contending with want of employment, sickness, births, or deaths in his family. Were they to try the experiment with all the economy they recommend to us, I think they would form a different opinion of what were high wages. Why, the very fact of so many being destitute proves that our wages are insufficient to meet the requirements of life under all circumstances. They preach economy, but our scale of living is already too low. With low wages, a married man is in a measure compelled to allow his wife to compete with the single women in needle and other work, and again producing low wages and starvation to those who depend upon it for a living.

It is the full belief of your wish to do justice to both employer and the employed that causes me to trouble you with this; and I beg as a favour, should the length or style of this letter preclude insertion in your columns, you will give the substance, as it is in accordance with the opinions of many who, like myself, think a man who is both able and willing to devote his time to labour, should procure the means of existence without the charity of any one, public or private.

A JOURNEYMAN CARPENTER.

A FEW WORDS TO BUILDING OPERATIVES ON THE PRESENT DEPRESSION.

SIR,—Observing, in your last week's publication, an article on the above subject, from a correspondent who calls himself an architect, I submit the following remarks:—You are no doubt aware that working men regard with suspicion anything, spoken or written by those who move in a higher sphere of life, that has a tendency to throw discredit on their conduct. To state in plain terms who I am, and my position in life, the following will suffice. I have wrought as a mason upwards of thirty years, in ten or twelve different counties in England and Wales. I have received as little as 2s. 6d. per day, and as much as 6s. I have lost as much as two, and sometimes three months' labour in winter, for want of employment: in summer I have made as much as eight, and sometimes even nine days' wages during the week. I have, during the thirty years, been married twice, and each wife has borne me six children. The first family has been trained to get their own living; the second are progressing towards the same desirable end. During the above-mentioned period, I have not obtained anything higher than that of a journeyman; neither have I received from any other source anything of consequence to supply my own and the wants of my family. As a double share of domestic duties has fallen to my lot, and as I am only a working man among working men, let them heed the following remarks.

The building trade has always been a fluctuating trade, and always will remain so, owing to circumstances which are very difficult to control. The present depression of trade is owing chiefly to the high price of provisions, and the large amount of war taxes which have yet to be removed. For instance, a very large number of houses in and around the suburbs of London, are finished, and fit for occupation; but the supply is far greater than the demand, not that London has been depopulated—population still increases, but the cause lies here. The war has enhanced the price of provisions—these must be obtained at every other sacrifice. The working man, who formerly had two or three comfortable rooms, at the present time makes shift with one. Many of the middle class give up their houses, and take apartments; thus, in thousands of instances where a house is only just convenient for one family, it is overcrowded with five or six. This, then, is the cause that house property has become such a drug in the market. It must be evident, if the builder could borrow money at 3, or even 2 per cent. and men would consent to work for half wages, if the builder had no reasonable prospect to let or sell those houses when finished, he himself would be in the sure road to ruin.

Your correspondent of last week, makes some severe remarks on the conduct of trades' unions. I am as averse to the principle on which those trades' unions are conducted as your correspondent. But let me state, once for all, clearly and distinctly, the cause of these trades' unions attaining such a formidable and threatening aspect as they do at present. Many of those who contribute their pence and shillings to support these unions, do it not willingly, but grudgingly, not as a matter of choice, but of necessity. For instance, a man not belonging to the trades' union applies to a master for employment: if the master employs him, and he refuses to join the society, a deputation is sent by the union, to state that the society men refuse to work with him; or, in other words, they demand the master to discharge him: the master, to avoid a temporary inconvenience, discharges him. We hear much in the present day of the tyranny of capitalists and employers: those who live in glass houses should not throw stones. I speak, or rather write, impartially. As an individual I have suffered more from the tyranny of trades' unions than I have from employers.

When I first came to London I hired a small furnished room on the fifth story of a ten-roomed house, for which I paid 5s. per week. A ten-roomed house, thought I to myself, and each room worth 5s. per week,—130*l.* per year. I soon shifted, and laid out a few pounds in furniture, and hired an unfurnished room at 4s. per week in an eight-roomed house. An eight-roomed house, each room worth 4s. per week,—more than 83*l.* per year,—too much, I thought. I soon left this, and engaged an eight-roomed house on my own account at 42*l.* per year; let off six rooms at an average of 3s. 6d. per week each, which enabled me to live rent-free. But 42*l.* per year for a house which cost about 350*l.* was, at any rate, 10 per cent. for the outlay,—too much, thought I. By dint of perseverance and strict economy the united savings of myself and wife, in the course of fourteen or fifteen years, amounted to the sum of 120*l.* I formed a resolution. I will borrow 200*l.* and add to my savings, and build a house for myself. A good eight-roomed house was soon built; ground rent, 5*l.* per year, and per-centage on 200*l.* cost me 15*l.* per annum. I could, in these circumstances, let off as much as when I rented a house at 42*l.* per year. I have made the above statement simply to show my fellow-men how they might better their condition. I think I am sufficiently skilled in reasoning to show them one cause of the present distress of many. Instance a case: there are many innkeepers sufficiently kind and obliging to trust men for the liquors they are disposed to take upon credit during the week. A very moderate week's account in this way often amounts to 7s. or 8s. I have observed that most men are sufficiently honest to pay of a Saturday night, that those kind favours of the innkeeper may be continued. The landlord "stands his pot" for favours received: this calls for another, and another, until the man, who has laboured hard during the week for his scanty earnings, forgets he has a wife and children waiting with eager expectation for the support they stand so much in need of.

The result of such conduct is simply this. On the Sunday morning hundreds are strolling to market in the purlieus of Marsh-gate and other similar localities.

The gin shops, the pledge offices, and the loan offices, all bear witness and give ocular demonstration which way the poor man's money goes.

To those working men who can take advice I give it:—

First. Observe, when you can obtain employment—avoid Saint Monday. Work the whole six days, if possible.

Secondly. Don't spend your money before you get it,—or, in other words, don't take anything on credit if you can avoid it. The man who pays ready money for everything will generally take care of his pocket.

Thirdly. Carry home the whole of your week's wages, and provide on Saturday night for the comforts and necessities of your families.

In conclusion, a few words to those who consider themselves the guardians of the workman's right. You have shown a vast amount of zeal in forming trades' unions,—in levying contributions to support strikes, sometimes of a frivolous nature. Here, then, is a subject at which you may employ your zeal to good account: thousands are out of employment owing to the depression of trade: thousands of innocent children are suffering the pangs of hunger owing to this depression: you have societies already organized, resources at command, in readiness to combat with any employer who chooses to infringe upon your alleged rights. Cannot these resources be brought to bear upon the present existing emergency? A work of charity,—a work of mercy presents itself to your notice, in which you are deeply interested. Such a step on your part, I am persuaded, would meet with public approval, and, in addition, public co-operation.

A STONEMASON.

"GOTHIC AND CLASSIC."

I SHOULD not have troubled you with any remarks upon this vexed question, had not the letter, which appeared in your impression of the 10th, been likely, from its type and position, to carry with it more than its due weight with the mass of your non-professional readers. Those who are *acquainted* with the style it condemns, will not be in the least affected by it.

The first part of the letter is either a misrepresentation or misunderstanding of facts; for the object which Mr. Scott, and all who sympathise with him, have in view is—if I understand it rightly—to recover and *establish* certain lost *principles*—the alphabet, as it were, of English "Pointed" architecture; in other words,

to restore that train of *thought* which, by patience and perseverance, produced such structures as the nave of Westminster, the chapter-house of Salisbury, the abbey at Tintern, the spire of Lost withiel, the north porch of Redcliff, &c. And I am truly surprised to find that any one should infer from the remarks in the *Builder*, of November 29, that the writer was anxious to revive or restore the "obsolete" fashions of a less civilised age, *simply* because they happened to be clothed in artistic forms. It is neither "fire-dog," nor "hoodwinked windows," nor "open ceilings," nor "buttresses," nor "pinnacles," — no, nor even all these things combined, which the architects of the movement desire to see revived; but it is that *propriety* which the Anglo-Roman, Saxon, and Norman all observed — *conformation to the laws and local characteristics of nature*, with the addition of the spirit of Christianity infused. But your correspondent would have us believe that Gothic architecture consists of "nought but pinnacle and gable, and buttress, and hoodwinked windows;" that its domestic "*essentials*" are "casements, admitting the external air in all seasons; fire-places so large, that all the heat generated upon the comfortless fire-dogs, is immediately transmitted to the nether heaven, open ceilings, and stained joists, giving a general cold church-like air to them, very depressing and unpleasant." Now, as there are, I dare say, some amongst your numerous readers who would be led almost to believe this summary, from the reflections which precede it on "useless papistical piscinas," "disease-engendering sedillia," &c. I think it would be wrong to let even such people remain in the belief, that Mr. Goodchild's *Gothic* is the Gothic of what he is pleased to call the "one-branch hands." It was to be hoped that the question, — What is Gothic architecture? had been decided, for one and all, but the communication in the *Builder*, of January 10th, 1857, containing direct and indirect censures upon its lack of "appropriateness" and beauty, shows that this hope was vain. Every one who knows anything at all of Gothic architecture, is aware that its very first element, without which it cannot exist, is "*appropriateness*" or *utility*. It must not be forgotten, however, that there are appropriate and useful features in the world which have no *direct* bearing upon our *physical* wants, and it is this dual appropriateness, *i.e.* the material utility, coupled with the *expression* of the religious or moral *feeling*, which constitutes architecture. This "expression" is only another word for symbolism; and, from the Druidical temple downwards, it must and will exist. I ask, then, what shall the works of the latter half of the nineteenth century be symbolical of— our Christian faith or our scepticism—our unity or our sectarianism—our higher or our lower nature? One of the great errors of the day is the supposition that Gothic or Pointed architecture *must be mediæval*, and that it is made up of "buttresses," "fire-dogs," "piscinas," and the like; things which have no more to do with this style than the toga, the tripod, or column flutings, have to do with the Classic. I fully agree with Mr. Goodchild, that the great mass of buildings "erected in the present day," which *go by the name* of Gothic, are failures; but the style *per se* would not be affected one iota if we went on failing for a century. What we really want is more *self-reliance*, more *thought*, more spirit-life, more faith, more unity, more love, and then both the Classic and Gothic of history may sink to their proper level, as food for the antiquarian and archæologist; for we ourselves should have a land-mark in the world's history, which would vie with either in originality, propriety, or beauty.

Culmore, co. Donegal. E. W. GODWIN.

LECTURE ON COLOUR AND ITS LAWS.—A lecture on this subject was delivered last week at Ipswich, before the members of the Mechanics' Institution there, by Mr. George Taylor, of that town. The lecturer successively touched upon the theory of light, the theory of colour, the properties of coloured rays, and the influence of coloured light upon vegetable and animal life, mentioning under the latter head the results of the numerous, interesting, and practically useful experiments made upon plants growing under coloured media.

ATHENS.*

THE connection of Athens with Peiræus and Munychia was effected during the administration of Pericles, by the erection of the two long walls (τὰ μακρὰ τείχη), each about four miles in length, and 550 feet apart; and with Phalærum, by the Phalæric wall (τὸ φαληρικὸν τεῖχος), running due south. The north long wall and the Phalæric were built first, and after the erection of the intermediate long wall the Phalæric was suffered to go to decay, as the Lacedemonians are only described as destroying *two* long walls; and when, after the battle of Cnidus, Conon rebuilt them, he probably used the materials of the Phalæric in their construction. These walls, ruinous at the time of the invasion of Philip, were destroyed by Sulla, and never afterwards rebuilt, their ruins being noticed by Pausanias, who flourished about A.D. 200. Their ruins may still be traced.

The most recent discovery of importance connected with the Acropolis is that of M. Beulé, who, not satisfied with the old entrance on the south side of the west outworks, has brought to light an ancient gateway, about 6 feet wide and 12 feet high, surmounted by a Doric entablature, between two flanking towers, at the west end of the Acropolis, exactly in front of the Propylæa. The surface of the rock appears to have been divided into platforms, communicating with one another by steps; and a recent distinguished author has called attention to the want of parallelism amongst the several buildings upon its summit.

The Pelasgic fortifications of the Acropolis, which defied the Spartans, having afterwards been partially dismantled, could not resist the Persians, who destroyed all the buildings within the citadel. The foundations of the ancient walls doubtless remained, but the walls afterwards built upon them retained but the name of the mighty founders of the Athenian race. The restoration of the north wall, called the Pelasgic, is ascribed to Themistocles; and imbedded in its masonry are portions of marble columns, and a complete Doric entablature of limestone, without doubt the remains of the earlier Parthenon.

We pause a moment to contemplate in thought the numerous remains of Pelasgic or Cyclopean construction scattered over the states of Greece, and by the same giant race implanted in the distant regions of Etruria, as shown at Norba, Cora, Signia, Alatrium, Fiesole, Arezzo, and other places—imperishable records of the Volsci, the Marsi, the Hernici, the Sabini, and other tribes.

The impressions of Pausanias, sixteen centuries ago, were probably much the same as those of the tourist of our own day; for the ruins remain much as they were. In solitary grandeur they attest the power of those who placed them there.

> "Rarus vacuis habitator in arvis
> Monstrat, Cyclopum ductas sudoribus arces."

"Their handwriting is yet upon their walls! A restless and various people, overrunning the whole of Greece, found northwards in Dacia, Illyria, and the country of the Getæ, colonising the coasts of Ionia, and long the master race of the fairest lands of Italy, they have passed away amid the revolutions of the elder earth, their ancestry and their descendants alike unknown. — yet not indeed the last, if conclusions are rightly drawn: if the primitive population of Greece — themselves Greek — founding the language, and kindred with the blood of the later and more illustrious Helenes—they still made the great bulk of the people in the various states, and through their most dazzling age: enslaved in Laconia—but free in Athens—it was their posterity that fought the Mede at Marathon and Platæa,—whom Miltiades led,—for whom Solon legislated,—for whom Plato thought,—whom Demosthenes harangued."

The Cadmeians, says Herodotus, were famed for their architecture, which they introduced into Greece, and there erected lofty structures dedicated to the sun, under the name of Pelorus, whence the term Pelorian was given to anything stupendous; and as by their works they judged the builders, so did they represent the Cyclopes as giants, and pursuing the same latitude of reasoning, termed anything vast Cyclopean.

> "Quicquid magnitudine sua nobile est,
> Cyclopum manu dicitur fabricatum."

Among the most celebrated ruins of this description, rank Tiryns and Mycenæ, in the plain of Argos, whose remains are composed of rough quadrangular blocks of stone, the interstices being filled in with small stones. Of Tiryns, only the walls of the Acropolis remain, which Dodwell considers must have been full 60 feet in height, judging from the fallen stones about them. Of Mycenæ, the capital of Agamemnon, the Gate of the Lions and the Treasury of Atreus excite intense interest. The lintel to the doorway of the latter is composed of stones in size only equalled by the masses of Egypt or Balbec. The circular chamber, 50 feet in diameter, and about 60 feet high, formed of parallel courses of breccia, averaging 2 feet in height, neatly jointed without mortar, and converging to the centre, not by radiating beds, but by horizontal courses, projecting before each other as they rose, and then smoothed by the cutting off of the lower angle, instead of typifying the future arch as some have thought, only goes to prove the principle was not even hinted at by these rude architects. The Treasury of Minyas, at Orchomenos, of which but ruins remain, the vault having fallen in, was, doubtless, of far greater size, and of marble. Pausanias fully describes it, whilst he only alludes to that of Mycenæ. It is supposed that all the subterraneous chambers of Greece, Italy, and Sicily, were similarly constructed. Of the four kinds of masonry into which the Cyclopean remains are divided, the first has its type at Tiryns and Mycenæ; the second where the stones are irregular polygons, fitting nearly into each other, as at Julis and Delphi; the third, wherein the stones are laid in regular courses, but of unequal lengths, as in Bœotia, Phocis, and Argolis; and the fourth wherein the stones are always rectangular, whereof examples exist in Attica.

Sir William Gell asserts the second method only to be Pelasgic, and to have been practised several hundred years before the Cyclopean manner. Thus, he says, the Pelasgi built Lycosura 1800 years B.C. and Argos even 56 years earlier; and that Tiryns was fortified by foreign artists from Lycia, called Cyclopes, above 400 years later. But our limits will not allow us to linger longer upon this most interesting subject. We will only refer the reader to Dodwell, Clarke, Hamilton, and other investigators, and return to Athens.

The remaining places and monuments of the lower town, whose identity is not disputed, are the Areiopagus (ὁ Ἄρειος Πάγος), or hill of Ares; the Pnyx (Πνύξ), or place of assembly; the Hill of the Nymphs; and the hill called the Museium (τὸ Μουσεῖον), after the poet Musæus, who retired thither for contemplation; the Dionysiac Theatre, and the Odeium of Herodes; the cave of Apollo and Pan, with the fountain Clepsydra, and the cave of Aglaurus; the temples of Theseus and of Zeus Olympius; the Horologium of Andronicus Cyrrhestes; the choral monument of Lysicrates; the Stadium; the gateway and aqueduct of Hadrian; and the Agora and Cerameicus.

The Council of Areiopagus sat as judges in the open air, on the south-east summit of the rock. Sixteen stone steps and a rude bench of stones mark the spot where they held their meetings. At the south-east angle of the rock is the chasm which formed the temple or sanctuary of the Eumenides. What structure there may have been in front of it has disappeared.

The identity of the Pnyx was first established by Chandler, Wheler and Stuart having both failed in their appropriation of the remains. It may be loosely described as a semicircular area, on a sloping ground, the chord of which is the highest point, the centre of the arc the lowest; the latter being bounded by a wall of huge polygonal blocks. The chord is marked by a line of vertical rock, hewn flat like a wall, in the centre of which, and projecting from it, is the Bema (βημα), or pulpit, often called the stone (ὁ λίθος), from which the orators addressed the multitude in the area, which, containing 12,000 square yards, could accommodate the whole of the Athenian citizens. Eloquence

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* See pp. 2, 31, *ante*.

was innate with the Athenians, and oratory flourished at Athens only. The fine organization of this remarkable people was such, that an ungraceful or unadorned style was repugnant to their sense. Cicero bears witness to this exquisite susceptibility where he says—"Sincerum fuit sic eorum judicium ut nihil possent nisi incorruptum audire atque elegans." Statesmen, generals, poets, all were orators, though but few of their orations have reached us. Of the remains that are extant, those of Lysias, Isocrates, Isæus, Demosthenes, Æschines, Demades, and Hyperides, rank highest; Antiphon, Antisthenes, Andocides, and others, take a secondary rank.

The Museium Hill was south-west of the Acropolis, and of not very inferior elevation. It contains nothing remarkable, if we except the remains of the Roman monument to Philopappus (for the description of which see Leake and Stuart), and the traces of numerous houses. Of the poet Musæus, supposed to have been buried on the hill that bears his name, none of the ascribed writings remain; but Diogenes Laertius has preserved to us a principle of his philosophy in the words—Εξ ἑνος τα παντα γινεσθαι, και εις τάντον αναλυεσθαι.

Beneath the south wall of the Acropolis lay the Theatre of Dionysus, commenced B.C. 500; being the first theatre built of stone in Athens, all previous ones having been of wood, and temporarily erected for the Dionysiac festival; and it was within such that the first drama of Æschylus was performed in the same year. After the discarding of these wooden moveable theatres, stone ones were erected in all parts of Greece and Asia Minor; Athens at the same time remaining the centre of the Greek drama and birthplace of Greek dramatic literature. Many of these theatres, although all of them constructed after the Athenian type, were not devoted to the drama, but to various public purposes; and even at Athens, the Theatre called Αγριππειον, and that of Herodes (ἐπὶ Ῥηγίλλη Θέατρον), were used for the declamations of the Sophists. The prodigious size of some of these buildings, as at Argos, Ephesus, and Epidaurus, is attested by the descriptions of Clarke, Dodwell, Leake, and others. They were usually erected upon a declivity, the part for the audience being hewn out of the rock, thence called κοιλον, *cavea*. The seats for the spectators, arranged in concentric circles, and occupying about five-eighths of the circumference; the broad passages (διαζώματα), *præcinctiones*, at intervals between these seats, and parallel with them; the stairs, at intervals, radiating from the centre, and communicating between the upper and lower seats, but breaking joint at each præcincto, by which the seats were divided into plots resembling on plan the section of a truncated cone, hence called κεκρίδες, *cunei*; the covered gallery forming the finish to the building, and following the semicircle of the theatre; the orchestra (ὀρχήστρα), the circular area within the innermost seat, round which the chorus performed their dances, and in the centre of which stood the Θυμέλη, or altar of Dionysus; the stage (λογέιον), raised above the orchestra, and terminated by the σκηνή, and, on each side, the παρασκηνιον: these formed the principal features of the Greek theatre as gathered from the evidence of Vitruvius, who likewise clearly marks the distinctions between the Greek and Roman theatres. "But these," says Donaldson, "and other statements of the ancients, have been somewhat twisted out of shape by architects unacquainted with the ancient dramatists; and philologists, in their turn, have blundered sadly for want of a knowledge of architecture." The whole body of the theatre and orchestra was open to the sky, and the performances took place in the daytime. The altar of Bacchus, as typical of the worship upon which the Greek drama was founded, occupied the centre of the whole building.

It is remarkable, that the theatrical representations of Greece retained to the last their original character; and even in the days of Sophocles those representations formed part of a religious festival: the theatre was sacred to Bacchus, and his worship as much regarded as the amusement of the people. The origin of the chorus belongs to the Dorians, who, adding appropriate dances to their hymns, thus instituted that important adjunct of the drama; and the Doric dialect is preserved in the lyric poetry of the other Greek tribes. Their dances in honour of Apollo, god of war and music, were either gymnastic or mimetic: the former, when intended merely as an exercise; the latter, when corresponding by gesture with the meaning of the chorus. Of the former class was the Pyrrhic, a dance peculiarly Spartan, accompanied by the flute, and the gymnopædian: the hyporcheme was of the class mimetic; and in these three dances we may trace the origin of the lyric element in the Attic drama. How Dionysus came to be the object of a worship formerly paid to Apollo was doubtless this: the Dorians worshipped besides Apollo a female form of the same deity. In the elementary worship of the Pelasgi and Achaians there were also two leading divinities, the sun and the moon, worshipped as Helios and Selene; and by the Pelasgic inhabitants of Italy as Janus or Dianus, and Diana. In Greece, however, the original names of these deities fell into disuse at an early period, and Bacchus or Dionysus became the adopted name for the sun-god, and Demeter for the goddess of the moon. Connected in their attributes with the old elementary worship of the Pelasgi, they became blended with the gods of the country. Dionysus was the Wine-god, Demeter the Earth, whence sprang the vine, and a natural transition invested *him* with the attributes of the sun that caused its growth, and translated *her* as his sister to the moon,—thus both becoming types of the celestial bodies that ruled the harvest and the vintage. As gods of the earth, attendant deities were assigned them; thus, to Bacchus were given the Sileni, to Diana, the Naiades. To these were added satyrs (from Σατυρος, a goat), beings half man, half goat; deified representatives of the old worshippers, who probably assumed for their costume the skin of the animal they had sacrificed to the God. Thus did the religion of Bacchus become incorporated with that of Apollo, and become the accepted creed of the Dorians.

The signification of the word Dionysus (the god of Nysos) proves that some word of which Δι or Δις was the root, was the generic name of the deity. The etymology of the dethyramb is a doubtful point; but it consisted of a chorus of fifty men or boys, who danced round a blazing altar to the music of the flute, and was thence termed the Cyclic Chorus; its subject, the birth and misfortunes of Bacchus.

But the first step towards the Drama in its ultimate development was extemporaneous narrative. Habited in goat-skin, like a satyr, the reciter debated upon the adventures of Bacchus. Hence arose the term Tragedy—or the Goat-ode, from τραγος, *hyrcus*,—ωδη, *cantus*,—even as Comedy, or the revel-song, drew its parentage from the κωμος.

Thus arose that tragedy which, shadowed forth by Thespis and further developed by Chœrilus, Phrynicus, and Pratinas, found its great exponents in Æschylus, Sophocles, and Euripides. As regards Comedy, from the first exhibition of Epicharmus to the last of Posidippus—a period of 250 years—one hundred and four authors are enumerated, of the works of a few of whom we possess but fragments only—the only complete plays that have reached us being the eleven of Aristophanes.

Two rows of seats at the top of the theatre of Dionysus are now visible, the rest being hidden by the accumulation of soil. The accurate dimensions of the building cannot now be ascertained: the upper part is evident, but its lower extremity is not visible; but it is supposed to have been large enough to contain the general mass of the Athenian citizens; and for beauty, Dicæarchus asserts it to have been the most beautiful theatre in the habitable earth (ὧδε ἠν τῶν ἐν τῇ οικουμἑνη καλλιστον θέατρον, ἀξιόλογον, μεγα και θαυμαστόν).

The subject of scenery, costume, machinery, &c. we could not allude to here; and the discussion of the Greek drama itself is and must ever remain the province of profound scholarship. Nor would it be possible to enter upon the differences presented by many theatres still extant from the general description we have loosely sketched. Whether women were present at theatrical performances has been a matter of much discussion, as there is scarcely any passage in ancient writers that alludes to it; but Jacobs and Passou have placed it almost beyond a doubt that they were present at tragedy, but not comedy. If so, their seats were separated from those of the men.

The Odeium (ὠδεῖον) was a building allied to a theatre in form, and sometimes called Θεατρον, but was much smaller in size, and roofed over, and was first invented during the flourishing period of Greek art in the fifth century before Christ, for musical contests. Vitruvius makes a passing allusion to the Odeium of Pericles. It stood at the foot of the south-east part of the Acropolis, and was burnt by Sulla B.C. 85. No ruins remain of it. The most magnificent edifice of the kind in the whole empire was that built by Herodes Atticus, at the western extremity of the Acropolis, beneath the south wall. Its greatest diameter was 248 feet, and it is supposed to have furnished accommodation for 8,000 persons. According to Pausanias, it surpassed all other odeia in Greece, as well in dimensions as in other respects; and its roof of cedar wood was particularly admired. There are still considerable remains of this building, but, says Mure, "in spite of their extent, good preservation, and the massive materials of which they are composed, they have a poor appearance, owing to the defects of the Roman style of architecture, especially of the rows of small and apparently useless arches with which the more solid portions of the masonry are perforated, and the consequent number of insignificant parts into which it is thus subdivided." Stuart's greatest mistake perhaps was assigning the remains of this comparatively small Roman building to the great Dionysiac theatre.

The other principal odeia were those of Corinth Patræ, Smyrna, Tralles, Mycenæ, and Nicopolis. There are also ruins at Laodicea, Ephesus, and other places in Asia Minor.

The Cave of Apollo and Pan lay at the north-western angle of the Acropolis, or, as described by Herodotus as situated below the Acropolis, and by Pausanias as a little below the Propylæa. The worship of Apollo in this cave was probably of great antiquity. The worship of Pan in this cave was not introduced until after the battle of Marathon, in consequence of the services he rendered the Athenians upon that occasion. Miltiades dedicated his statue, and Simonides wrote the inscription to it. A statue of Pan, found in a garden near the cave, and now in the public library at Cambridge, may possibly be the identical statue dedicated by Miltiades. The cave measures 18 feet by 15 feet, and is 30 feet in height. The fountain mentioned by Pausanias was called Clepsydra (κλεψύδρα); more anciently Εμπεδω. It derived its name Clepsydra from its being supposed to have had a subterraneous communication with the harbour of Phalerum.

The Cave of Aglaurus in the μακραι, or Long-rocks, said to be the point whence Aglaurus and Herse threw themselves. Eastward of the Cave of Pan are two caves, one of which contains thirteen niches, proving it to have been a consecrated spot, and one of these was probably the Aglaurium. Leake assigns one of these caves to Aglaurus, and the other to Herse. The Athenian Ephebi, on receiving their first suit of armour, were accustomed to take an oath in the Aglaurium that they would defend their country to the last.

We must conclude our remarks in another number.

CROWN FERRIES IN THE WAY OF IMPROVEMENTS.

ON the 19th instant, as our readers may have noticed, a deputation of the committee of the Conservative Land Society and of the inhabitants of Isleworth, attended the Chief Commissioner of Woods and Forests, for the purpose of obtaining permission of the Crown to land on the Surrey side of the railway bridge across the river Thames, at Richmond, a project having been formed to erect a foot bridge as an appendage to the existing railway bridge.

The Society had already obtained the consent of the City Corporation and the South-Western Railway Company to this very desirable improvement for the public convenience; but

although the deputation informed the Chief Commissioner that the inhabitants of Isleworth and Richmond were prepared to construct the proposed bridge by voluntary subscription, and devote it to the public use, in order to save a detour of nearly a mile; they were met with the objection that the proposed bridge would interfere with ancient ferry rights, and that the Crown revenues could not be sacrificed. These "revenues," it is stated, amount to only *a few pounds* a year; and it was urged (in vain) that by the development of the neighbourhood, the two ferries in question would actually be enhanced in value. Mr. Gore, in reply, merely asked the deputation why the promoters did not purchase the ferries then. But this, it seems, would be too costly an affair for the proposers. A few old women, who lived by knitting stockings for those who could afford to have them in times gone by, would have prevented the manufacture of that necessary article of apparel by machinery, which placed them within the reach of all. Are not the Woods and Forests acting somewhat like the aforesaid old ladies? Inconveniences shall not be lessened: the public shall not have improved means of transit: the two sides of the river shall not be connected, and so improved, for fear we should lose our pennies. Surely, this is a very wrong position for them to take.

CONDITION OF OPEN CISTERNS.

ONE of your correspondents having given a sanitary hint in reference to being frozen out, &c. and as you invite workmen to give any information upon matters connected with their work, I would call the attention of the public to the inside of their cisterns; for when the workman goes to repair the pipes that have been burst by the frost, or stopped with dirt, if he has given sanitary matters any consideration he is shocked to find in cisterns a vegetation only to be found in that position; a vegetation which, as the supply ebbs and flows, leaves its marks on the sides of the cistern in green slime, coating the side as though it had been painted, and in the summer there is a crop of strange-looking plants, such I think as are not found elsewhere.

Your correspondent having ventilated the ventilation of our houses, perhaps a hint on that subject would not be out of place. When we find the windows streaming with the condensed breath of the inmates, or frosted on the insides with the cold, it is a broad hint Nature gives that the ventilation is defective; and when one knows that the head of the family has been at work all day in a badly ventilated workshop, it will not be out of place to respectfully call the attention of employers to any simple method by which they can ventilate their workshops. Take a jeweller's workshop over a stable, for example, where a number of men are employed, and who are injuring their health by working in a badly ventilated workshop,—and workmen who work in close shops are very sensitive of cold draughts,—but, if there were self-acting ventilators fixed in the roof, those would imperceptibly ventilate the shop, the men would be better in health, and grateful to their employers.

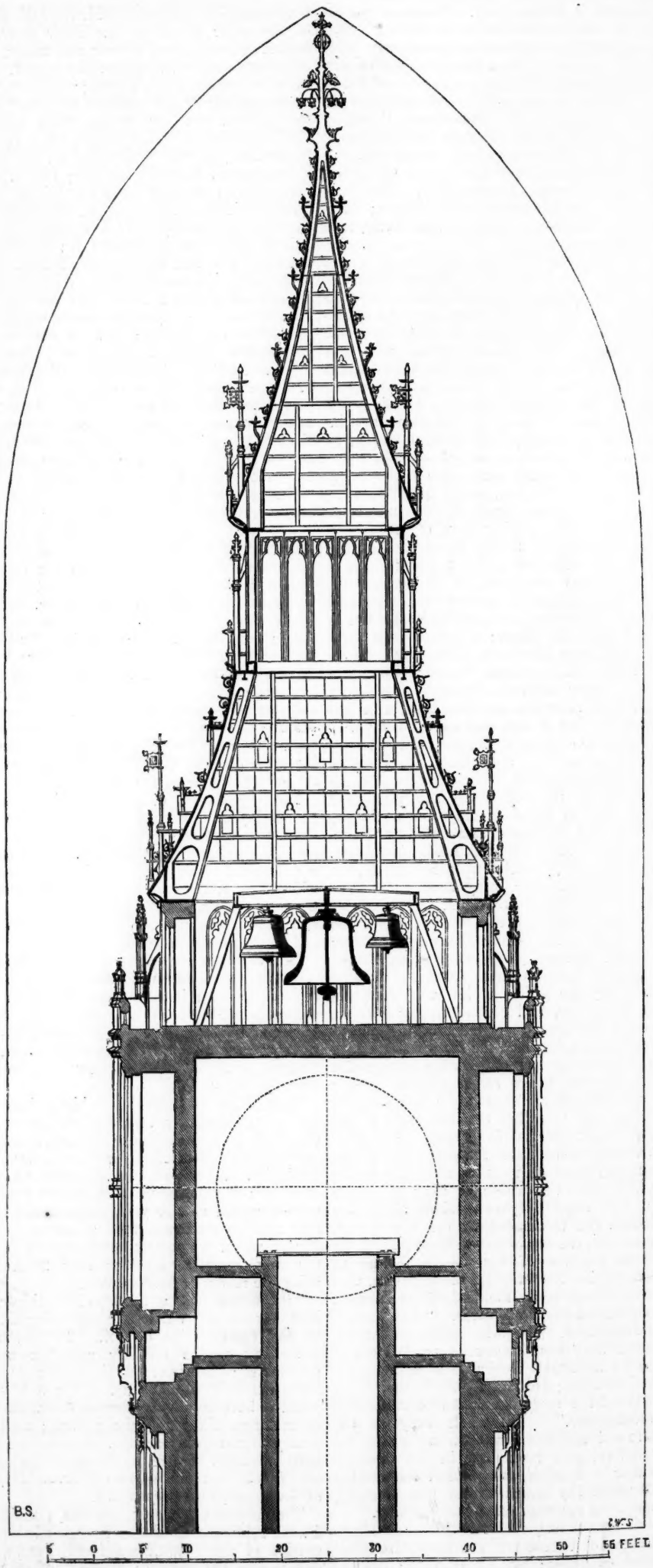
A WORKMAN.

FRESCO IN NEW PUBLIC OFFICES.

ALTHOUGH the remarks I am now about to make may be slightly premature, I hope it may draw your attention and that of others to this most important fact. As we all know, the new public buildings in Berlin and Munich have not a mass of bare walls, but they are all decorated with fresco. What impression did the staircase of the Museum in Berlin make upon you?—those glorious compositions of Cornelius and Kaulbach—equal in mind to Michelangelo? What think you after this of our British Museum, with its cold blank walls? What say you of the Glyptothek, in Munich, with Overbeck's perfections of loveliness, compared with the hall of the National Gallery? The want of fresco in our clubs and learned societies is a glaring defect, as also in the portico of any of our theatres. How splendid are those in Munich in a similar position!

I now most earnestly desire that, at least, the halls and staircases of the new Government Offices about to be competed for, may, at least, be decorated with fresco of grand biblical and historical subjects; and I sincerely hope this may lead our talented artists and connoisseurs to press this most necessary subject for the benefit of art, in order that we may have as grand works as Berlin and Munich, and that our buildings may not have those horrid blank walls so unclassical and unusual in the *finest* specimens of architecture.

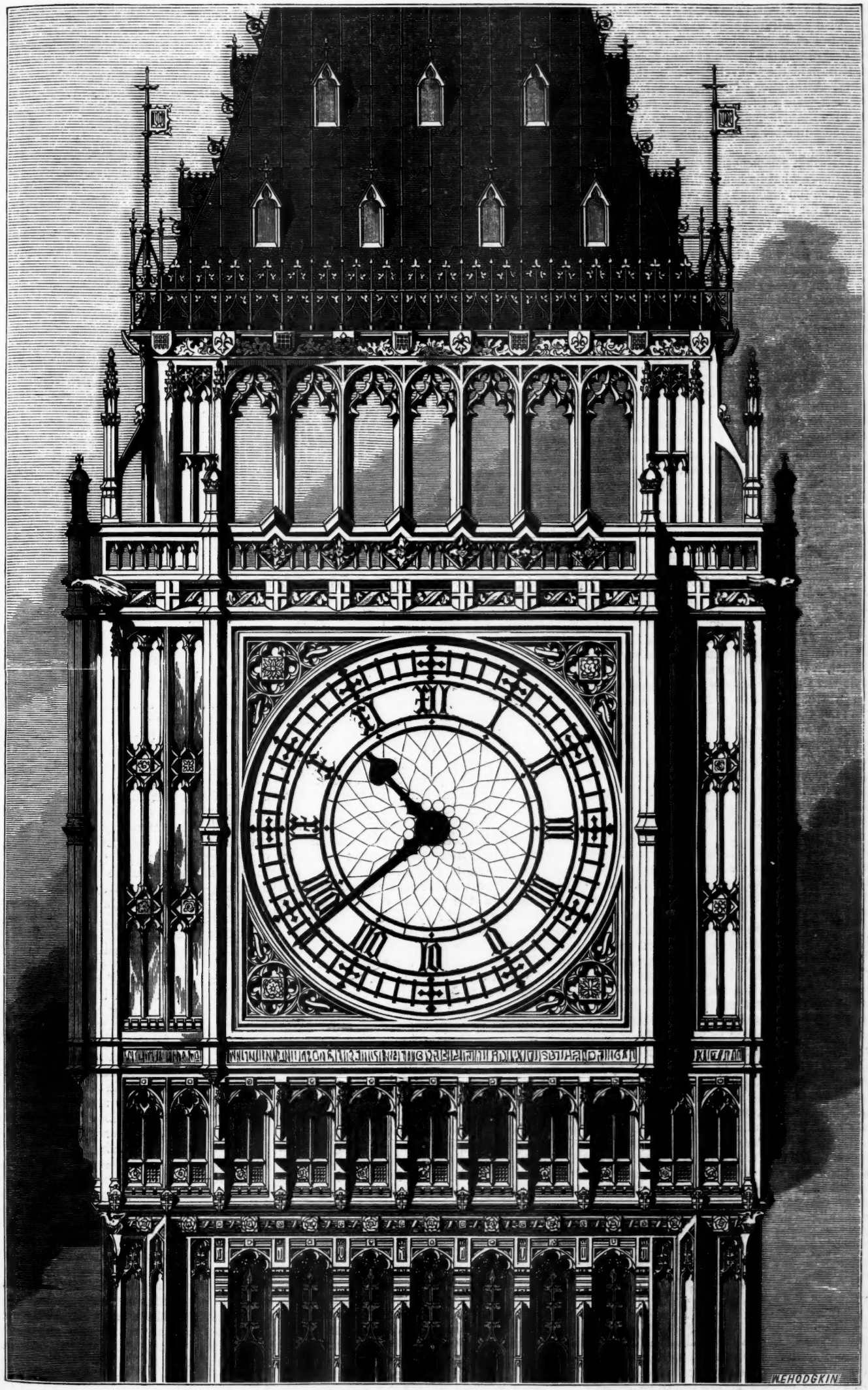
CHARLES DE VERE.



THE CLOCK-TOWER, WESTMINSTER NEW PALACE.

Section of upper part.

[See p. 57, *ante*.



THE CLOCK-TOWER, WESTMINSTER NEW PALACE.——SIR CHARLES BARRY, R.A. ARCHITECT.

[See p. 57, *ante*.

THE USE OF IMAGINATION IN MODERN ARCHITECTURAL DESIGN.

THE ARCHITECTURAL ASSOCIATION.

THE use of imagination in modern architectural design was the theme of the paper read by Mr. Ruskin at the Conversazione of the Architectural Association, on Friday evening, the 23rd inst.—when there was a very full attendance of members and visitors, and the walls displayed a number of interesting drawings and sketches.

Mr. Ruskin commenced by observing that on reading over what he had written it seemed to have taken too much the form of advice. He was sorry for that; but he had been told that the paper he was to read was for young architects, and he must shelter himself behind the plea that a man might be qualified to give advice to others merely by having made mistakes himself. If they were asked abruptly, and required to answer shortly, what were the qualities which distinguished great artists from mean artists, he believed they might reply,—first, their imagination; second, their industry. Some of them might doubt the justice or the necessity of attaching so much importance to this latter quality, because there might be dull men who were industrious, and clever men who were indolent; but though the industrious man might be dull, and the indolent man might be clever, he had never known a great man who was not industrious. During such investigation as he had been able to give to the lives of the great artists who had influenced the world by their career, no fact ever loomed so much upon him, and no law was so universal in its application as this,—that they were all great workers. One of the unfailing characteristics of great artists was the astonishing quantity of work they accomplished during their lives. When they heard a young man spoken of as giving early promise of future excellence, the question they ought to ask was, "Does he work?" But though this quality of industry was essential to an artist, it did not make an artist; for many people were always busy whose doings are of little worth. Neither did feeling make the artist; but the gift which distinctively made the artist,—without which he would be feeble in life and forgotten in death,—was that of imagination. He would not occupy time by attempting to give any close definition of what the word imagination implied: we have all a sufficiently distinct and general idea of it, in our minds and in our hearts; and all pay an involuntary respect to that power wherever it can be recognised. Imagination was not manipulation, or calculation, or attention; it was something more, something higher than all or any of these. If an architect lays his bricks and stones well, we praise him for his manipulation; if he keeps well within his contract, we praise him for his calculation; if he arranges his beams so that nobody drops through his floors, we praise him for his caution. But, if he is to be a great architect, he must do something more than possess and exercise these qualities,—he must in the meantime be telling fairy tales out of his head. Then it remained to be considered what fairy tales in and by architecture, can be told, and what can be done by the architect by the heart as well as by the hand. Perhaps the first idea of a young architect in these days was to think that it was incumbent upon him to invent a new style worthy of our times and country; but if there were any of his hearers who had been impressed with that responsibility, he would ask them whether every inventive architect amongst them was to invent a new style? or whether every inventive architect was to invent a piece of the new style, and then to put their styles together afterwards by subscription? If so, who was to be the Columbus destined to lead them to the undiscovered island which was to be the El Dorado of new styles? After all, when a new style was invented, what were they to do after that? Could they do more than build in it? or what could they secure in building in a new style that they had not in the styles already known? Their new style might be different from everything ever known before; all the orders of architecture might be entirely reversed,—but what next? He thought that if they quietly considered the subject they would see that if they were not content with a Palladio, they would not be content with a Paxton, and he prayed them to get rid of the idea of there being any necessity for the invention of a new style. He would not address himself to those, if there were any, among his hearers who hoped to obtain celebrity by the invention of some strange way of building, but to those who would be content with that degree of celebrity which had satisfied our forefathers. The architect of Salisbury Cathedral might be well content with having erected that building, though he was not the inventor of Gothic; and one might be satisfied with such fame as Titian enjoyed at Venice, though he was not the inventor of oil painting. They must consider, then, what room was left for the exercise of the imagination under such conditions. First, it would be said that the principal exercise of the architect's fancy must be in the disposition of lines and mouldings in agreeable proportions. But he would ask what invention or imagination was necessary to this? What degree of fancy was called forth in the arrangement of the symmetrical lines and agreeable proportions of Whitehall Palace? Did the symmetry and beauty of that building ever inspire with a feeling of bravery the mounted soldiers who gaze upon it for hours together while on duty beneath the arches of the Horse Guards? or did they think that the lovers of London ever go down to the shadows of Whitehall for consolation when their mistresses are unkind? Proportion was dull, to say the least of it, and he would ask men of genius on the proportionate system upon what achievement of the past would they in their old age look back with satisfaction? Nearly every other art and profession had the pleasure of doing some good attached to it, either to the professor himself or to others, while the profession of architecture now left its professors in a position in which they could neither act nor feel nor see. He thought they might abandon the theory of architecture being in proportional lines, and find something better upon which to feast their fancy. In choosing their way of working, the young architect should endeavour to bring out all his faculties, and not be satisfied with expanding only some of them. If architectural designing led to no pleasant journeys, if it did not excite life and emotion, and passion, it sank into a condition in which those who practised it were neither numerators nor denominators, but mere common fractions. Their imagination should exhibit faculties of sympathy with living creatures, and all the varied beauties of nature around us. In order to show more clearly what he meant by imagination, and to contrast the works of our great forefathers with the commonplace and dull productions of the present day, the lecturer illustrated his remarks by exhibiting two photographs, one representing the sculptures in the south transept door of the cathedral at Amiens, the other the sculpture over one of the doors of the cathedral of Notre Dame. The sculptor, in the former of these, had represented with life-like accuracy the principal incidents in the life of St. Honoré, from the period of his being made Bishop of Amiens to his death, and the funeral ceremonies consequent thereon. That, in truth, was the work of the imagination of a great artist. In contrast to that he exhibited a drawing of a hole-in-the-wall building on the lines and proportions system, which did not require the aid of imagination in its design, and which any one might find in the "Encyclopædia Britannica," from which the drawing was copied, "according to scale." He regretted in modern times the separation between sculpture and architecture, the former, indeed, being that in which their imagination should be shadowed forth. In order to give their imagination and the other powers of their soul full scope, architects must themselves be sculptors; they must not study building without sculpture, and must themselves use the chisel. In fact, the lecturer went on to show that sculpture alone was architecture! Nicolo Pisano sculptured his panels and mouldings with his own hand; but our modern architects ordered bishops at so much a mitre, and cripples at so much a crutch. The great painters of old did not disdain to paint small pictures as well as the frescoes of the colossal gallery, and why then should the modern architect disdain to fill up the spaces of his great building by sculptures of his own, instead of trusting such a work to others who had not, perhaps, the same imagination as himself. It might be said this would require much time and labour; doubtless it would, but nothing great, or worthy of a great man, was ever accomplished without both these. What a field was opened to the fancy by the junction of sculpture with architecture! Nearly every other art was limited in its space; but was there anything within the range of sight, or thought, or conception, which might not be of use to the architect, or in which an interest might not be awakened to the advantage of his art? The whole animal, vegetable, and mineral kingdom bent down before and was at the disposal of the architect; and as there was nothing in life, so there was nothing in lifelessness which had not its lesson for him and its gift. Now, that their art presented all those materials to them, they had already much to rejoice in; but they had more to rejoice in because all these were submitted to them not to be dissected and analyzed, but to be sympathised with, in order to bring out what might be called the moral part of their imagination. They had seen that if they kept among lines and proportions only, they should have cause to envy the naturalist, because he was conversant with facts; but they would have nothing to envy in him if they made themselves conversant with feelings arising out of his facts. Their work was always with the living creature; the one thing they had to get at in him was his way of living,—his mode of going about things; but in order to sympathise with living things, you must be familiar with them. We frequently are silent when we consider the responsibility that may attach to words, of which the chance is that few will be heard at all, or, if heard, will be forgotten; but none of our words would be unheard or forgotten if we talked well. Let him talk well in his works, and the artist would be remembered long after he was gone; let him build large enough, and carve boldly enough, and all the world would hear him. Let him see that his work was happily done, or it never would make any one else happy; let him be influenced but by one noble impulse, and let that impulse be love—love for the art he practises, and for the creatures to whom he ministers it. They might rest assured that if ever any other motive than love for the art they practised became the leading one in their mind, that moment it was all over with their art. He did not say that they were not to desire money, or fame, or position; they could not but desire all three; nay, they might (if they were willing to allow him to desecrate the word love for a moment),—they might love all three,—that was, earnestly covet them; but they must not do that in the first place. The question was one of first or second. Did their art lead them?—or did their desire for gain lead them? They might like making money exceedingly, but if it came to a fair question of whether they were to make 500*l.* less upon a business, or to spoil their building, and they chose to spoil their building, it was all over with their art. They must love art for its own sake, and if they allowed the desire for money, for fame, or for position to take precedence over the love of their art, they were not in the true sense artists,—they were mechanics and drudges. In the next place, they must love the creation they work in the midst of, for wholly in proportion to the intensity of feeling with which they approached to the subject they had chosen would be the depth and justice of their perception of its character; that perception was not to be gained at the moment they wished to bring it to bear, but must be the fruit of an intimate feeling of love and sympathy. He could not caution his hearers too forcibly to keep clear of petty, mean cares; whatever they did, let them not fill their heads with little chagrins and little desires. It was possible they might get into a habit of saving money; that at a time of great trial they might yield to the temptation of speaking ill of their fellow artist; but they would shorten their powers and dim their brightness even by this. Let them keep themselves quiet and peaceful, with their eyes open. They might be anxious for the good opinion of Mr. So and So; but it did not matter what Mr. So and So thought of their

work: it mattered only what the birds were doing up there in their nests: it did not matter whether the workman would do what they wanted him to do, it did matter what that little ragged urchin was doing at the corner of the street, or the children who were gambolling in the doorway. Unless they were in the habit of long watching birds and children, they could not sympathise or feel with them. In order to have a due appreciation of nature, they must accustom themselves to see it in all its phases. The highest nobleness was commonly among the poor, the aged, and the infirm. It was not the strong arm of the soldier, or the health of the young beauty, that were the best studies for art. It was not in the church pews, where the gay dresses were, but in the church free seats, where the widow and the mourner were, that they would discover the finest feelings of nature portrayed. Lastly, they must love the creatures to whom they ministered,—their fellow-men,—for if they did not love them, they would be little interested in the passing events of life, and be apt to be struck only by the outside form, and not by the interior. If they would be great, let them be also kind. So soon as they desired to build largely, they would find that their work must be associative; one could not carve a whole cathedral himself,—either their own work must be disgraced, or they must raise their fellow-designers to some correspondence of power. They would take the lead in disposing of their building, but they must trust to the genius and invention of others in the disposal of its detail; and in doing this, too, they must rejoice in the very powers that may promise to rival them. If they endeavoured to depress or disguise the talents of their subordinates, they were lost to their art, for it was their own prosperity they were seeking, and their own skill that they were striving to perpetuate. He placed no utopian standard before them; he had said that they must surrender their own pre-eminence to their love of building, and whomsoever they found better able to do what would adorn it than they were, that person they were to give place to, and rejoice at seeing their edifice growing more beautiful under his chisel, and next rejoicing that they had done kindly. The man who sees capacity in another, and does not acknowledge it, or assist in bringing it forth, is not the refuser of a kindness, but the committer of an injury. They had the sweet consciousness that as their art embraced a wider field than all others, so it was more profound and holy than all others. The artist when his pupil is perfect, must see him leave his room that he may pursue his destiny perhaps as an opponent in toil; the man of science wrestles with the man of science; but architects alone were called by kindness to fraternity of toil. Those massive piles which rise above the domestic roofs of our ancient cities have a meaning more profound and true than is commonly attached to them. Men say they are good for worship,—but so is every mountain, glen, and rough sea shore; they have the indisputable and distinguished glory that their mighty walls were raised by men who have given aid to each other in their weakness, and the strength of their structure has its foundations on manly friendship which conduces to awaken the sweeter cadences and symmetry of the human soul.

CHURCH-BUILDING NEWS.

Kingston-upon-Thames.—The church of St. Mark (Surbiton), in the above parish, has been opened for evening service, having been fitted up for gas by Messrs. Hart and Son. The fittings include ten brass coronas in the nave, of twelve burners each, and three larger in the transept. The chancel has two rich brass pendants, containing thirty-six jets, with foliage of the passion-flower leaf. The coronas are suspended from ornamental brackets, fixed under the clerestory windows, illuminated with vermillion, ultramarine, and gold.

Wisbech.—The parish church of St. Peter and St. Paul, Wisbech, in Cambridgeshire, was reopened on the 20th instant, after a thorough restoration of the interior. This church is an object of interest to antiquaries and ecclesiologists. It consists of a double nave with aisles, and a double chancel. The tower is attached to the north side of the church. The work is of various dates. The chancels are both of the Decorated period, to which also belong the exterior walls of the aisles, but the aisle windows are of very late Perpendicular work. The arcades of the nave are of three distinct dates, viz. the north arcade, Norman, with very slender shafts; the central arcade, Perpendicular; and the south arcade, Decorated. The church has for a long time been in a most unsightly and even dangerous state, crammed with hideous pews, and two tiers of galleries, and banked up outside with soil to the window-sills. In 1853, plans were obtained from Messrs. Glover and Smith, of Norwich, architects, for refitting the interior, and effecting the repairs most urgent, but it was not till 1856 that the parish was in a position to commence the work, which was then placed under the control of Mr. Slater, of London, and executed under the immediate superintendence of Mr. W. Smith, one of the architects originally employed, and Mr. J. Butler as clerk of works. The whole of the galleries have been removed, and the church has been reseated with oak benches of simple design, with pulpit, prayer-desk, lectern, and chancel-seats of richer character. The chancel ceiling has been fresh panelled, and the ancient carvings, which had fallen into the possession of a townsman, have been restored by him, and replaced, and the requisite new supplied. The east window, a special gift, has been renewed, from a design of five lights by Mr. Smith, and filled with stained-glass by Messrs. Hardman, of Birmingham. The church is lighted with gas, the standards being from Messrs. Skidmore's, of Coventry. The organ, an old and valuable one by the celebrated Harris and Greene, has been removed to the east end of the south aisle, and refitted by Messrs. Hill, of London. The cost of the works has been about 3,000*l.* besides the east window, 400*l.* The general contractor for the works was Mr. Ringham, of Norwich. The church affords accommodation on the floor for 1,600 persons.

Walsall.—A special meeting of the local Burial Board was held at the Guildhall last week, for the purpose of opening and considering tenders that had been received for the erection of chapels, entrance-lodge, &c. on the grounds of the new cemetery. Of six tenders, the choice lay between those of Mr. Walter Heaps, builder, Walsall, and Mr. C. Burkett, of Wolverhampton; the former offering to do the work creditably for 1,544*l.* the latter for 1,548*l.* The Board resolved on accepting Mr. Burkett's tender.

Sheffield.—The parish church was lately reopened. The changes made are chiefly the removal of obstructions, and a step towards restoring the church to its original form. For many years, the centre arches under the tower have been blocked up by the organ, thus making an entire separation between the chancel and the nave of the church. The gallery of the north transept, and a number of useless pews in the transept, have now been removed, and the organ is placed near the floor of the north transept. The arches under the tower are again opened, revealing the old view of the entire church from east to west. A further obstruction to the view is removed in the old pulpit—a heavy and cumbrous structure. It has been replaced by a light pulpit, which stands at the foot of one of the piers of the tower. The western pews are carried forward, so as to fill up the old passage between the doors which have been closed, and the space it occupied is allotted to an inner porch, crossing the western end, for the convenience of the three new doors. The alterations have been carried out under the direction of Mr. T. J. Flockton, architect, under whom Messrs. Dutton and Heald have been the carpenters, and Mr. Mastin, the mason. Mr. Shaw, of Saddleworth, has furnished the new pulpit and reading-desk. The churchyard at the western end of the church has been lowered and asphalted between the grave-stones, so as to give good access to the new doors. These alterations have been carried out by subscription, and have cost between 600*l.* and 700*l.* It is the intention of the Rev. Dr. Sale, the vicar, says the local *Independent*, to present to the church a western window in coloured glass. The window is already in progress, in the hands of Mr. R. Drury. The design is foliated in colours.

Eston (*Yorkshire*).—A Congregational Chapel is about to be erected at Eston, a rapidly increasing village in the heart of the Cleveland ironstone district, situate between Redcar and Middlesborough. The edifice will be built of the stone of the district, in the Early English style of Gothic architecture, and have a belfry on the north gable. Mr. Oliver, jun. is the architect.

DISCOLOURATION OF STONEWORK.

IN the last number of your journal I observe a correspondent complains of the formation of a green lichen or moss (a microscopic specimen of an algæ) on some recent stonework. I should recommend that the walls be washed over with a dilute solution of bichloride of mercury (corrosive sublimate), say, half an ounce of the salt to one gallon of water. Arsenious acid, also, dissolved in a weak solution of common pearlash, would most probably effect what your correspondent wishes.

The cause of the "green" appearance would be various. It may rest with the stone itself,—the latter being perhaps, from its chemical composition or physical structure, especially adapted for the retention of organic matter, and the germs of minute cryptogamous plants.

Again, the presence of hygroscopic moisture may tend to encourage vegetable life, or the drain to which your correspondent refers, having some slight leakage or gaseous emanation, may furnish the predisposing influence.

It might be well to know more concerning the nature of the stone, and of the class of diseases most prominent in the neighbourhood.

WENTWORTH L. SCOTT.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary meeting of the Institute, on Monday, the 26th (Mr. Godwin in the chair), Mons. Didron, aîné, of Paris, was elected Hon. and Cor. Member; Mr. Henry Shaw, Hon. Member; and Mr. John Thomas Christopher, and Mr. Joseph Gale, Associates.

The discussion on the various methods of indurating and preserving stonework was then resumed, by the reading of a paper by Mr. de Witt, on the chemical part of the subject, in reply to Mr. C. H. Smith. Papers by Mr. Huskisson (Tonbridge Wells), Mr. Ransome, and Mr. Daines, on their several processes were read, and statements were made by Mr. Barrett and Mr. Page. To these we shall refer hereafter. Mr. Jennings, Professor Tenant, Mr. Burnell, and others took part in the discussion.

Reference being again made to the stone work of Buckingham Palace, Mr. Dines, on the part of the representatives of the late Mr. Thomas Cubitt, desired it might be understood that Mr. Cubitt had always objected to the use of the stone which was employed, and merely obeyed orders.

On the announcement of the subscriptions already received for a memorial of the late John Britton, to be placed in Salisbury Cathedral,

Mr. Ferrey suggested that, as works were going on at the church of Kington St. Michael, the place of Mr. Britton's birth, the restoration of a part of the church would be a better mode of appropriating the subscriptions.

GAS WARMING AND VENTILATING APPARATUS.

THE great extension of the use of gas in dwellings and places of business now absolutely requires the general adoption of something like a civilized mode of gas-ventilation,—as requisite in rooms lighted or heated by gas as chimneys are in those containing grates and stoves. Nothing but the general *invisibility* of the noxious products of gas combustion has prevented this necessity from being *seen*; whereas the more invisible the carbonaceous fumes or smoke may be, the more pernicious is the product; for in this case, mere smoke is more or less converted into the well-known means by which, in France especially, so many suicides are effectually accomplished, namely, carbonic acid gas, as from charcoal stoves. The perfect combustion of illuminative gas gives essentially the same product, combined with others, some of which are no less pernicious. In burning gas without proper gas or other chimneys to carry off these villanous products, therefore, we are acting with greater barbarism and ignorance, and with vastly more mischievous consequences to health, than the poor Irish peasant displays in burning his peat in a small hovel without an ordinary chimney. What we have more particularly to say in the present instance, however,

relates to the warming as well as ventilating of apartments through the ordinary chimney, by means of gas apparatus. This double purpose is at present proposed to be effected in a mode which has been patented by Mr. Adolph, of St. Mary-axe, who recently exhibited his apparatus in operation at Bucklersbury. The invention, as described in the *Morning Herald*, consists of a small box, on the hearth, containing the gas jets, the top covered with talc. At one end of this box there is an aperture to admit the air for supporting the combustion of the gas. Another aperture at the opposite end communicates with a tube passing in a spiral through the hot-air box, and finally out at the chimney. Through this tube the whole products of combustion pass, raising the temperature of the air surrounding it, without in the least contaminating it. The dry air as it is heated passes out into the room through two perforated plates at the top of the box, its place being supplied by cold air admitted at the lower part. There is also an aperture at the top of the apparatus which can be closed, by which the room is effectually ventilated. The whole is fitted in such a manner as to occupy the position of an ordinary stove. It is also contemplated to distribute the light from the gas-jets about the room by means of compound reflectors. An equal temperature of 60 deg. Fahrenheit may thus, it is said, be maintained in a large room at the cost of about ½d. per hour.

ON SUBMARINE ELECTRIC TELEGRAPHS.

INSTITUTION OF CIVIL ENGINEERS.

AT a meeting of the Institution, held on the 13th inst. Mr. I. K. Brunel, Vice-President, in the chair, the paper read was "On Submarine Electric Telegraphs," by Mr. F. R. Window.

In a brief relation of the early history of the Submarine Electric Telegraph, it was stated not to have been the invention of any one person, but rather the result of the combined researches and exertions of many experimenters. The first mention that the author had been able to find of any method of sufficiently insulating wires as to enable them to conduct a current when submerged in water, was, in an account of some experiments made in India by Dr. (now Sir W. B.) O'Shaughnessy, in 1839, recorded in the Journal of the Asiatic Society. In these experiments the wire was covered with tarred yarn, and enclosed in a split ratan, which was again enveloped in another coating of tarred yarn.

Shortly after this (in 1840), Professor Wheatstone gave it as his opinion, expressed before a committee of the House of Commons, that a submarine communication between England and France was practicable. And in October of the same year, a paragraph in the "Bulletin de l'Académie Royale des Sciences de Bruxelles," stated, that Professor Wheatstone had discovered a means of joining Belgium and England by a submarine telegraph. The nature of the discovery was not, however, mentioned. All these experiments were made previous to the suggestion of Professor Faraday to use as an insulating agent gutta percha, which, up to the present time, has been universally employed. An extract from an American newspaper was given, containing an account of a submarine telegraph stated to have been successfully constructed by Colonel Colt, from Hell Gate to Fire Island, and in which it was also said that the same gentleman had applied to the United States Government for funds, for the purpose of forming a telegraphic line from America to Europe.

In 1848 a submarine telegraph wire, insulated with gutta percha, was laid by Lieutenant Siemens, of the Royal Prussian Artillery, under the Rhine, from Deutz to Cologne, a distance of about half-a-mile. And in January, 1849, Mr. C. V. Walker towed a similar wire two miles in length out to sea, off Dover, and sent signals to London through it.

In August, 1850, a gutta percha covered wire was laid by Mr. Wollaston from Dover to Calais, through which signals were sent with success, but it lasted perfect only about twenty-four hours.

On the 25th of September, 1851, a cable, consisting of four insulated wires incased in a sheath of ten No. 1 iron wires, was laid down from Dover to Calais, by Mr. Crampton, assisted by Mr. Wollaston, and was stated to have remained perfect to the present time.

The author discussed the respective merits of the compound cable system, or the collection of many insulated wires into one cable, as in the Calais and Ostend telegraphs, and the simple cable containing but one wire, as in the lines of the International Telegraph Company to Holland and Ireland: the greater facility which these latter afforded for repair, and the less chance of having the business stopped by rupture, since one wire only, and not all, would be affected by the cause, was pointed out; and it was shown that the cost of the two systems did not materially differ.

The conductive power of submerged wires was then theoretically investigated, and it was shown that a considerable difference as to time existed between the transmission of signals upon suspended wires, and upon insulated wires immersed in water, or buried in the earth;—that while with the former it appeared that the only limit of practical speed was the possibility of deciphering the signals; in the latter the electric current required an appreciable period of time to arrive at its destination, and another longer period to escape from the wire into the earth, and that this period of time increased regularly with the length of the wire; consequently, upon a line formed of submerged wires of considerable length, there would always be a limit of possibility of the number of signals that could be transmitted in a given time. These effects were stated to be caused by lateral induction, the insulated wire assuming the nature of a Leyden arrangement of vast dimensions, where the copper wire represented the inner coating, and the film of moisture surrounding the gutta percha acted as the outer coating.

The author argued, that since submarine lines were more costly than suspended lines, and nevertheless a smaller amount of business could be sent along them in an equal time, it was important that no pains should be spared, whereby this lateral induction, and consequently the evils arising from it, might be reduced; though, being in accordance with a law of nature, it could not be entirely avoided.

BERWICK CORN-EXCHANGE COMPETITION.

WILL you kindly, by circulating this little ditty amongst your readers, give a chance, to such of them as competed for the Berwick Corn-Exchange, to get rid of their superfluous indignation by singing it to the tune of the sum expended by them on their design?

A COMPETITOR.

Sing a song of Corn Exchange,
Barley, wheat, and rye,
Five-and-fifty architects
Competing for "my eye."
Now the drawings are sent back,
Needs must that I sing,
The Berwick competition
As a very noble thing.

The treasurer is at his desk,
Grinning at the money;
Directors sitting at the Board,
Looking very funny;
To think so many architects
In greenness were agreed,
To make out plans, and pay their freight
To Berwick-upon-Tweed.

"I'll tell you," quoth a jolly man,
"The only way that we
"Can show our sense of this expense
"And labour that we see.
"We must choose one from this here lot,
"I'm very much afraid:
"That done, we'll then send back again
"The rest, with freight *unpaid*."

The resolution passed *nem. con.*
The Board were much amused,
To think how all these architects
Would feel themselves ill-used.
If any of them read this song,
I'm sure they'll wish good speed,
To the Corn Exchange Directors
At Berwick-upon-Tweed.

ST. MARY'S TOWER, TAUNTON.

THE following is the report referred to in a recent number:—

"In consequence of your request that we should again take into consideration the state of this tower since our examination of it in 1855, and report to you our final opinion, after weighing the several facts brought to our notice in the reports made at various times, and more recently by the survey and statements as communicated by Mr. Carver, we have given our most careful attention, and have duly reconsidered the subject in all its important bearings, animated by the most anxious desire to avail ourselves of every practical suggestion that could afford a hope of preserving so noble a structure. The exceedingly dilapidated and fractured state of the tower has been fully dwelt upon in the reports of all those professional gentlemen who have been called upon to survey its condition, and no difference of opinion exists in regard to the facts: there are the most startling evidences of failure in the construction and decay in the external stonework, and were they to be found in a building of less architectural interest, their existence would probably be considered quite fatal to any scheme of preservation, and no professional man would hesitate to advise rebuilding, with certain success, in preference to less substantial measures of repair. We will not, however, conceal our most earnest wish, if possible, to preserve this tower in any way consistent with safety. 1st. Because of its inherent beauty of proportion and detail. On this ground we should be content to recommend a course of repair, falling short of an entire renovation, yet preserving the main decorative features, leaving those details which may still endure many years to be removed at a future time when they may become ruinous; nor should we desire to disguise the new portions which may be renewed by any attempt to tone the new stonework to the grey tint of the old masonry. 2nd. As regards the safety of the structure, although the settlements and fractures are of an accumulated character, they are not such, as far as we can judge, to render the tower immediately dangerous. Supposing those projecting features of the external design removed, which, from the external decay, are liable to fall, no apprehension of danger need be entertained, either from the spreading of the walls, or the subsidence of the masses of stonework; provided the weather is not permitted to penetrate the fissures. We are, therefore, of opinion that it is practicable for the tower to be shored up, and the lower stage (where the crushing effect is most manifest) to be made strong and lasting, and that by well-inserted bond stones, cement grouting, and other means, the superstructure can be greatly strengthened, and further chance of settlements arrested. But here the certainty of remedial measures appears to us to cease; for though the re-fixing of the bells, under this measure of repair, may be permitted, it would scarcely be safe to allow them to be rung in joyous peals: they should be used only for chiming: the vibratory effect caused by a full peal might be productive of mischief to walls which, under the most successful treatment of repair, could not be said to possess the strength which belongs to walls well built; nor can we say, that when the works have been effected, there may not occur such rapid progress in the disintegration of the remaining outer stonework as to render further expense soon necessary. Under these circumstances, we do not see that it is possible for us to give a definitive opinion as to which course should be adopted. It is clear that there is a choice of two modes of proceeding. The one a restoration, which may not produce a result quite adequate to what would be the natural wishes of the inhabitants, inasmuch as it cannot restore the tower to that full degree of strength which such a construction should possess, though it would have the advantage of retaining, in a certain degree, the identity of the structure. The other, a perfect reconstruction, which, if properly carried out, would ensure all that could be desired, but with the loss of that identity. In placing these alternatives before the parish, we should wish to guard the parishioners against two misapprehensions which may arise. In the first place, let it not be imagined that, because we speak of the danger to the tower not being immediate and imminent, it will be safe to go on doing nothing. The failure might at any moment increase so as to render reparation impossible; and the continued exposure to weather, and the penetration of wet and frost into the fissures, render such a change far from impossible. It is therefore madness to think of letting it remain as it is. It *must* either be repaired or rebuilt. On the other hand, we wish to guard against the opposite extreme: your deductions from what has been said might lead you to take down the tower without having provided means for *ensuring* its reconstruction. It is far too valuable an inheritance to be risked. If you feel that a reparation would not ensure it to you in that substantial and permanent form which you think desirable, it is only the more necessary that in determining on its reconstruction, you make it certain before you take any step for taking down the present tower that its reconstruction in all its integrity shall be *absolutely guaranteed*, as the present structure repaired and partially restored would be infinitely preferable to a new one stopped short of completion.

(Signed) "G. G. SCOTT.
BENN. FERREY."

WOLVERHAMPTON WORKHOUSE COMPETITION.

As it was announced in your Journal of the 17th instant that the design of Messrs. Bidlake and Lovatt, of Wolverhampton, was selected from amongst several submitted for the inspection of the Guardians, we wish it to be understood by the profession at large that none of us submitted designs for the competition in question.

The Guardians having determined upon allowing to the successful competitor a commission of *four per cent. only*, we declined acceding to their terms, and, at a meeting which we held upon the subject decided upon, and addressed, the following letter to the Board.

[The letter urged that the time allowed for sending in plans for the enlargement of the workhouse should be extended, and also that the architects' commission should be at the usual rate of five per cent. upon the outlay, instead of four, as stated in the advertisement. It said,—

"In the second place, we view with considerable anxiety, the proposal for reducing the commission from the usual five per cent. to four per cent. as a remuneration to the successful competitor, and this not only in a pecuniary point of view, but from the conviction that, if the introduction of such a system is allowed, it will be alike injurious to the profession and the public at large. Five per cent. is now universally acknowledged to be the fair and legitimate remuneration of an architect for designing and superintending a building, and which, while it is in no case more than a sufficient payment, is in many cases obviously insufficient to cover the necessarily great expense and labour which an architect has to incur in preparing himself for, and discharging his onerous and responsible duties; besides, it has been found that the tendency of this reduction of the commission, in the few places where it has been tried, has been to lower the standard of honour and morality among the architects, and to induce them, in order to eke out their insufficient remuneration to an extent at least commensurate with the usual per centage, to accept from builders and other persons employed, gratuities and fees in some other way.

We have always most steadfastly opposed this system, and intend still to do so; and we earnestly hope that the guardians will, now that their attention is called to the subject, at once alter their proposals, and thus discountenance a system which would assuredly be the means of bringing a class of persons—we will not call them architects—into Wolverhampton, who, while they would meet the views of any committee, or individual, as to reducing their rate of commission, would, at the same time, reimburse themselves in the unscrupulous and non-professional manner we have named, and this, of course, at the expense of their employers."]

You will perceive that Messrs. Bidlake and Lovatt attached their signature to the letter; and yet, with a gross violation of good faith towards us, they ultimately decided upon accepting the terms of the Board by sending in designs.

It is useless for architects to complain of the unfair treatment they receive as competitors, if there be not a little unanimity of action amongst themselves.

That our letter addressed to the Board of Guardians met with responsive feelings from the majority of professional men in this neighbourhood, is made evident by the fact of there being but *four* designs sent in, not one of which met with the full approval of the Board, or was considered as adapted to their purposes; in fact, on this account several of the guardians declined voting for any of the plans submitted. (Signed)

ROBERT EBBELS,
EDWARD BANKS,
GRIFFIN and WELLER,
J. R. VEALL,
} Architects.

Wolverhampton, Jan. 27, 1857.

STAINED GLASS.

South Wales.—Mr. Clutterbuck has just completed the eastern triplet for the new church of Llandugwydd, near Cardigan, rebuilt in the First Pointed style. The three lights contain nine medallions, illustrative of our Saviour's life; intermixed with geometric patterns. The subjects are arranged as follow:—1. "The Annunciation;" 2, "The Birth;" 3, "The Baptism;" 4, "The Last Supper;" 5, "The Agony in the Garden;" 6, "The Crucifixion;" 7, "The Burial;" 8, "The Resurrection;" and, 9, "The Ascension." The same building is also being enriched with eight painted windows, from Mr. Lavers's studio. The four side lancets of chancel and south window of tower are filled with geometric glass, all donations to the church. The two west lancets and large sixfoil over same are memorial windows to a late parishioner, and exhibit in the two lancets four of the works of charity; viz. "Hungry, and ye fed me;" "Thirsty, and ye gave me drink;" "Naked, and ye clothed me;" "Sick, and ye visited me;"—well drawn, richly coloured, within geometric patterns, of which the sixfoil is also composed. For the neighbouring church of Llanfair-Nantgwyn, restored in the Middle Pointed style, Mr. Lavers has also executed five windows, all being the gift of the lay-impropriator. The east window, of three lights, contains the subject of the Crucifixion in the centre, and on either side the three Marys, and SS. John and Joseph of Arimathea, and the good centurion, under rich canopies and grisaille background. The south window of chancel contains armorial bearings; and the two west windows are quarry glass, with the emblems of the four Evangelists. The third church in the same locality, which is now being filled with Mr. Lavers's glass, is the new church of Aberporth, rebuilt in the Middle Pointed style, and containing three painted windows: the two-light windows, south of chancel and west of nave, with tracery, are filled with geometric glass, both gifts; and the east of chancel, a three-light window, with three quatrefoils in the head, is also filled with geometric glass; the centre light containing a large drawing of the Ascension of our Lord, with the emblems of the Trinity, Holy Lamb, and the Pelican, filling up the tracery. The whole of the foregoing windows have been executed under the superintendence of Mr. Withers, architect.

LAYING OUT NEW STREETS.

BOARD OF WORKS.

AT a meeting of the Board, on the 23rd inst. Mr. Wright moved the adoption of a report from the Committee of Works and Improvements, recommending—

"That the designs which may be sent in to the Board by the several competitors, showing the best mode of laying out the surface and subsoil of the new streets, and other particulars described in the resolution of the Board of the 16th of January, be referred to a committee of seven persons, consisting of four professional men, and the chairman and two other members of this Board.

"That the Committee of Works be authorised to select four professional men for that purpose, and that the Board do nominate the two members to be associated with the chairman."

The proposition led to an animated conversation, in which it was urged that if this proposition was adopted it would be a public declaration that the Board was destitute of common sense, and could not decide which was the best plan that might be submitted to them.

Major Lyon moved, as an amendment, that two professional men be selected, instead of four, to assist the committee.

Mr. Alderman Cubitt, M.P. seconded the amendment, and said from what he had seen of subways in the Rue de Rivoli and in the Boulevard de Sebastopol, in Paris, he felt impressed with the fact that the subject of sub-ways was by no means developed.

Ultimately the original motion was carried by a majority of 13 to 10.

BUILDERS' BILLS.

HANNAFORD *v.* HILL.

THIS was an action at the Sheriff's Court, Middlesex, before Mr. Undersheriff Burchell, brought by a slater, to recover the sum of 18*l.* from the defendant, who was a builder, for a large slate cistern capable of holding about three tons of water. The defendant resisted the claim on the ground that the cistern was inefficient for the purposes for which it was intended.

It appeared that the defendant contracted to do certain work for the General Apothecaries' Company, 49, Berners-street, Oxford-street, amongst which was the fitting up of two slate cisterns, one a small one, and the other large enough to hold 900 gallons of water. The plaintiff undertook to make and fix them up for the sum of 18*l.* 18s. He put them up; but when the large one was finished, objection was taken to it as too weak to hold the water. Some strengthening bolts and fillets were then added to it; but when it was fully charged, it leaked at the side and at the bottom. The plaintiff was applied to, and he had something further done to it to strengthen it, but the defendant ultimately rejected it, had it taken down, and another put up by another tradesman. The plaintiff accounted for the leakage by the settling of a new wall upon which it rested, which opened one of the joints of the tank; while the defendant's witnesses said it was because the sides and ends did not fit into the grooves, but, on the contrary, they were filled up with putty. A large amount of evidence was given on both sides, when the jury returned a verdict for the plaintiff for the amount claimed, 18*l.*

THE BLASTING OPERATION AT HOLYHEAD HARBOUR.

THIS operation, mentioned in our last but one, took place on Friday, the 16th inst. under the personal direction of Mr. Charles Rigby, assisted by Mr. Reitheimer, the resident engineer of the firm. It is computed that above 120,000 tons were brought down and broken into masses ready for loading by this explosion. The aggregate charge in the four chambers, acting upon a face of 210 feet in length, 115 feet in height, with a line of least resistance of about 25 feet, was 16,000 lbs. of gunpowder. The voltaic battery was placed a short distance from the quarries, and the spectators were within a protected battery or observatory in front of the mountain, at a distance of only 600 yards from which they were enabled to witness the explosion without danger, not a stone having been propelled 100 yards from the face of the quarry. We may here mention that nearly 6,000,000 tons of stone have been already dislodged by this means for the construction of the harbour, without failure and without accident. In the mining operations which take place for this purpose, the quantity of gunpowder used annually exceeds 500,000 lbs. or more than 250 tons, and the stone deposited in the sea, for the formation of the rubble foundations and embankment, exceeds yearly 1,000,000 tons. In addition to the agency which gunpowder affords for the rapid construction of this breakwater, there are employed upwards of 1,200 men, a large number of locomotive engines, stationary engines, travelling cranes with steam power, and every modern appliance which mechanical skill can bring to bear to accelerate the completion of this important harbour of refuge.

The northern (or great) breakwater is at present about 7,000 feet in length, or nearly one mile and a half, and will enclose an area of upwards of 800 acres of Holyhead Bay. The breakwater extends about a mile and a half from the Holyhead shore, a small portion of which is walled in and finished, the rest being a rough embankment covered with piles and scaffolding. The present cost to the country is about 700,000*l.* The water shelter now provided by the new harbour is about 370 acres, in which upwards of 200 vessels have at one time anchored. About 280 earth waggons and trucks, and eight locomotive engines are in regular use; and employment is given to about 1,000 persons, at a cost of about 1,000*l.* per week in wages. The consumption of powder is about 200 tons per annum: the quantity of rock thrown into the sea is about 4,000 tons per working day, or over 1,000,000 tons per annum. The length of embankment already made is about 7,000 feet, and it takes about 1,000 tons of rock to extend it 1 foot into the sea.

ELECTRO-TELEGRAPHIC.—The directors of the Electric Telegraph Company have resolved to recommend a dividend at the rate of 7 per cent. per annum at their half-yearly meeting on the 5th of February.

THE SHEFFIELD NEW SCHOOL OF ART.

THE new building for the Sheffield School of Art was occupied by the annual meeting of subscribers held on Thursday in last week. The entire cost of the new premises, including site and fittings, is 7,100*l.* of which 1,600*l.* are still to be realized. The ground is of irregular form. Fronting to Arundel-street it has a width of 47 feet, and at this width it extends backwards for 55 feet. Then the ground widens to the extent of 72 feet, and at this width it extends backwards 78 feet to Arundel-lane. The principal frontage, therefore, is 47 feet, the back frontage 72 feet, and the depth from front to back 133 feet. The natural position of the ground is a very steep descent from front to back, and this has afforded the facility for a basement story behind, on the level of Arundel-lane. The front of the building is in the Byzantine and Romanesque style. It is built of coloured brick, relieved by stonework. The front door opens into a hall 25 feet 3 inches, by 18 feet 3 inches, and 16 feet high, lighted by two windows on the right side of the door. From the front door a corridor runs through the front and centre portions of the building into the elementary room, which occupies the full breadth of the site in the Arundel-lane front. To the left of the door is the council-room, 34 feet by 19 feet, with windows to Arundel-street. Behind the entrance-hall, and to the right of the corridor, is the geometrical room, 26 feet 10 inches, by 19 feet. Behind the council-room, to the left of the corridor, is the principal staircase. From the foot of the staircase the corridor crosses the centre portion, which contains the lecture theatre and life school. At this part the building is contracted for the sake of leaving on each flank a court for the benefit of side lights. On the left is the lecture theatre and life school, 35 feet by 33 feet. This theatre, and also the corridor, open into the elementary room, which, according to the local *Independent*, from whose columns we here quote, presents the greatest flat floor in the town. Its dimensions are 69 feet 4 inches, by 39 feet, and its height is 21 feet. It is lighted by seven large and lofty windows looking into Arundel-lane. Returning to the foot of the staircase, which is lighted from the roof, we ascend by wooden stairs, 6 feet wide, enriched by newells and oak moulded hand-rails, to the first floor. The staircase terminates in a corridor, corresponding with that on the ground floor. Opening out of the corridor at the head of the stairs is the principal master's room, 19 feet by 18 feet. The Arundel-street front is occupied by the female school, 45 feet by 25 feet, with nine windows to Arundel-street. Adjoining this school are bonnet and cloak rooms, lavatory, and other conveniences. Over the theatre and life school is the painting room, 35 feet by 27 feet. The sculpture gallery is situated over the elementary room, and of the same dimensions. This room, 69 feet long, 39 feet wide, and 21 feet high to the flat ceiling, is lighted by a counter light from the roof. An attic over the front part of the building is divided into a number of studios for the principal and more advanced students. There are various other accommodations. The principal means of warming are two Gill stoves, manufactured by Messrs. Jobson Smith, and Co. of Sheffield. Two ventilating shafts, into which there are communications from the ceilings of the various rooms, traverse the building from bottom to top, and with the aid of the Gill stoves in winter, and of a small fire in summer, maintain a current which carries off the foul atmosphere, and allows its place to be supplied by pure air. Messrs. Manning and Mew were the architects, Mr. Mycock, the contractor, and Mr. French clerk of the works. Mr. Mycock's contract was 4,400*l.*; extra charges about 182*l.*

The annual meeting was held in the council room, and the report was read by Mr. Young Mitchell. It stated that during the past year the school had fully upheld its high character. The council hoped the national schools of the town would avail themselves of the advantages held out by the Government for introducing art-education. The income for the past year had been 984*l.* of which 510*l.* was a grant from Government, 255*l.* were from students' fees, and 203*l.* from subscriptions. The report was approved of and adopted.

Miscellanea.

PROPOSED STATUE TO THE LATE MR. BROTHERTON, M.P.—A large and influential meeting was held in the Town-hall, Manchester, on Monday in last week, presided over by the mayor of Salford, when it was agreed that a marble or bronze statue in honour of Mr. Brotherton (who died so suddenly in an omnibus a few weeks ago) should be erected in Peel Park, Salford. Between 900*l.* and 1,000*l.* were subscribed towards the object at the meeting, the mayor of Manchester and several other gentlemen contributing 50*l.* each.

NEW COTTON-MILLS AT BOLTON.—In 1856, five new cotton-mills were commenced in Bolton and the neighbourhood, says the *Manchester Courier*, namely, a large and handsome mill at Gilnow, for 65,000 spindles; another large mill in Lostock, for 60,000 spindles; one in Westhoughton, for 30,000 spindles (all by Mr. Woodhouse, architect); one in Great Bolton; and one in Little Bolton. There are about to be erected at least four other new mills, one in Halliwell, for 40,000 spindles; one for 30,000 spindles, near Tanner's Hole; one at Farnworth, for 30,000 spindles (all by Mr. Woodhouse, architect); a large one in Halliwell (by Mr. Holt, architect); and the Mount Pleasant Mills, which have been standing a considerable time, are undergoing alterations, under the superintendence of Mr. James Lomax, surveyor. These will make an addition of ten mills, and others are spoken of.

LABOURERS' DWELLINGS IN LIVERPOOL. — The block of buildings in Northumberland-street and George-street, Toxteth-park, erected by the local association for the improvement of such dwellings, has now been completed. This is the first block of forty model dwellings to which the project extends. The company was formed in 1854. It was originally under the metropolitan charter, but was subsequently registered as a limited liability company. The Albert cottages, a similar undertaking, in Frederick-street, had conferred a great social benefit, and proved satisfactory as a pecuniary investment. For the Northumberland-street scheme, nearly 800 shares, of 25*l.* each, were taken. The plans were submitted to the Health Committee of the Town Council, who approved of them, and made some suggestions as to the arrangements. The buildings have cost upwards of 6,000*l.* Detailed plans and a sketch of the elevation, have been lithographed. The dwellings are various in accommodation: they contain, besides the living room, one, two, or three bedrooms. Gas is introduced into the living rooms throughout, and each dwelling is supplied with a scullery, sink, water-tap, shelves, plate-rack, larder, coal-place, and water-closet; and there is a common dust-shaft. The access is by a fire-proof staircase. Ventilation and drainage have been specially attended to. There are general washing-rooms in the basement, and drying-rooms in the roof. Near the washhouse there is a bath-room, and a large room is appropriated to an infant-school.

FALLING IN OF THE PORTWOOD NEW BRIDGE, STOCKPORT.—On Monday in last week considerable alarm was created by the giving way of the new stone bridge now in the course of erection over the river Goyte. The bridge was in a very forward state, having been turned on each side nearly to the centre, ready for the key-stone. Five of the workmen were engaged on the arch, when Peter Wilson, the foreman, hearing something crack under him on the Portwood side, communicated his fears to the person next to him; and, on looking, observed that one of the bolted beams had split, and the dependent framework was giving way in consequence. The next moment he felt the stone work sink: he gave a sudden spring into the water, and instantly the bridge fell, leaving nothing but the buttresses standing. Two of the men escaped, and the other three were but slightly injured. The upper portion of the arch, having fallen inwards, struck the corbels of the buttresses, and broke them off. The damage, it is expected, will not exceed 200*l.* and the contractor is not limited as to time.

SCOTTISH AGRICULTURAL DWELLINGS IMPROVEMENT ASSOCIATION.—The annual meeting of this Association was held in Edinburgh last week; the Duke of Buccleuch presiding. Sir John Forbes read the third annual Report, which stated that the Directors had, in different parts of Scotland, been urging the necessity of increased accommodation for agricultural labourers, and had sent plans for cottage accommodation. He congratulated the meeting on the beneficial results which had followed the operations of the Society during the three years of its existence, and the warm interest which was now beginning to be felt in its proceedings by noblemen and gentlemen in every part of Scotland. The Report was approved of, and the progress declared to be highly satisfactory.

BENDING SHEET IRON FOR BEAMS.—Mr. John Le Cappelain, of New Bridge-street, has invented some alleged improvements in machinery for bending sheet iron into corrugated forms for constructing beams. On the main shaft or axis of the power there are three wheels with rounded rims. The main axis or shaft is carried by parallel bars, capable of being moved to or from each other. Above the three wheels there are two other similar wheels capable of adjustment. The sheet iron to be bent is placed on ledges or supports attached to the two side bars, and as the iron is progressively bent, the two upper wheels come more and more between the lower wheels.

VITAL STATISTICS.—An interesting return of the vital statistics of the metropolis during the past year has just been published by the Registrar-General. In the fifty-two weeks terminating on the 27th of December, 44,159 boys and 42,674 girls were born, and 28,894 males and 27,892 females died. Assuming the population in the middle of 1856 to have been 2,616,248, the mortality during the past year was twenty-two in 1,000, which is lower than in any year except 1850, when it was a little under twenty-one in 1,000. It is computed that, with the addition of soldiers and seamen who have returned from the seat of war, the population of London at the close of 1856 was 60,000 more than it was at the close of 1855.

EXPERIMENTS BY THE PATENT TIMBER-BENDING COMPANY.—Some experiments in bending timber for various useful purposes, lately took place in the premises of Messrs. Collinge and Co. Bridge-road, Lambeth. The experiments are said to have been carried out principally to convince the Government that an immense saving might be obtained to the country by the adoption of the new mode of bending into a permanently set form every kind of wood into any shape. Amongst those present were, Admiral Best, Admiral Sharpe, Captain Carnac, R.N.; Captain Edmunds, R.M.; Captain Mackinnon, and several others. One experiment consisted of a small specimen of oak, which is said to have been quickly bent into the form of a hoop, which was afterwards straightened, and eventually turned inside out. Another experiment consisted of a large oak ship's floor timber, 12 inches by 8 inches, which was in a quarter of an hour bent into a right angle. The cost of curved wood consumed in the British islands under the present method of supply in its natural condition amounts, it appears, to at least 5,000,000*l.* sterling per annum, partially occasioned by the waste of that method. The new process of bending timber will it is said, reduce the cost of ships of all sizes 25 per cent. and greatly increase their strength and durability, by avoiding the necessity for using cross-grained wood.

RAILWAY MATTERS. — A railway from Durham direct to London, is talked of; capital, 4,000,000*l.*: it is designed exclusively for the carriage of coals and other minerals, bulky goods, cattle, and agricultural produce, and to be named the "Northern Coal Railway."——The traffic returns of the railways in the United Kingdom, for week ending January 10, amounted to 387,951*l.* and for the corresponding period of last year, to 364,251*l.* showing an increase of 23,700*l.* The gross receipts of the eight railways having their termini in the metropolis, amounted to 161,401*l.*; and last year to 154,637*l.* showing an increase of 6,764*l.*——The increase on the Eastern Counties amounted to 1,245*l.*; on the Great Northern to 789*l.*; on the Great Western to 992*l.*; on the London and North-Western to 3,842*l.*; on the London, Brighton, and South Coast to 256*l.*; total, 7,104*l.*; but from this must be deducted 91*l.* the decrease on the London and Blackwall, 34*l.* on the London and South-Western, and 215*l.* on the South-Eastern. The receipts on the other lines in the United Kingdom amounted to 226,550*l.* and last year to 209,614*l.*; showing an increase of 16,936*l.*——Mr. E. Talbott, of Spring Vale, Staffordshire, has invented a peculiar construction of split or compound rails, "enabling him to manufacture half or split bars with perfect bearings or flanges, and which, when combined, have the required strength and structure of ordinary rails."——Mr. W. Rye, of Manchester, has invented certain improvements in fixing or fastening rails of railways in their chairs.

ST. MARY'S, MOORFIELDS.—The chapel of the "Sacred Heart," in this church, was opened on the 18th, having been decorated by Mr. Shaw, of Upper Thames-street. The principal cornice is finished in crimson, blue, green, lavender, and dead white, with the dentils and capitals etched with gilding. The pilasters are of Sienna marble, and the lower portion of the walls in imitation of panelled blocks of jasper, Irish green, and Italian antique, with bases of Verd antique and Egyptian green. The altar is painted dead white, and has gold relieved with colours on the several mouldings. The panels are filled with arabesque ornaments, and the door of the tabernacle has a painting of "The Sacred Heart," and instruments of the Passion. There is a painting on the wall above the cornice, of a "Pelican in her Piety," on a gold background. The works have been in progress for three months, under the direction of Mr. John Young, jun. architect.

A HINT ON LIGHTING THE PROPOSED NEW NATIONAL GALLERY.—While lately travelling in Italy, I noticed a most excellent plan of lighting picture-galleries from above and below; but I am sorry I cannot remember for certain what town it was in, but I think Bologna; and I hope this will call the attention of architects to it, that they may visit and study it. It is decidedly a great "dodge," if I may use the vulgarism.—C. DE V.

BRISTOL ATHENÆUM SOIREE.—A *soirée* was held in the Victoria-rooms, on Wednesday in last week. The whole suite of rooms was engaged, and pictures, drawings, photographs, stereoscopes, and other works of art and amusement diversified the proceedings. There were also music and dancing; and the president of the Athenæum, and the Mayor of Bristol, and other gentlemen briefly addressed the assembly. On the following day the rooms were thrown open to visitors at a nominal charge, and large numbers of the inhabitants availed themselves of the opportunity to inspect the numerous objects of interest collected within the building.

ART MANUFACTURE EXHIBITION AT EDINBURGH. —After a brief season, the first annual exhibition of the Art Manufacture Association of Scotland, in the National Gallery at Edinburgh, has closed. From its opening, on the 13th of December last, it is estimated that it has been visited by considerably upwards of 60,000 persons. In the course of the exhibition several evenings have been devoted to *conversaziones* and lectures. Among the speakers and subjects have been,—Professor G. Wilson, "On the Application of Ornamental to Industrial Art;" Mr. M. Wellwood, of Pitliver, "On the History of European Porcelain;" and Mr. C. H. Wilson, Glasgow, "On the Improvement of Ornamental Art;" and the concluding lecture was to be given by the hon. secretary, Mr. A. Christie, "On the Objects of the Association in forming the Exhibition."

THE SOCIETY OF ANTIQUARIES OF SCOTLAND.—At the last meeting of this society, a paper was read, entitled "Poetical Maxims from a Painted Room in the Old House at Culross, called 'The Palace,' with Notices of the History of the Building and its probable Founder," by Mr. A. Jervise. In this paper Mr. Jervise described the old house at Culross in which the painted roof in question occurs, and adduced some reasons for supposing that it was erected by Sir George Bruce, third son of Sir Alexander Bruce, of Blairhall, in the end of the sixteenth century. One of the rooms, which has a carved roof, is lined with wood, divided into eighteen panels or compartments, all of which are filled with curiously painted pictures illustrative of morality and virtue, with appropriate and quaint maxims in verse. Of these Mr. Jervise deciphered thirteen. Mr. Cosmo Innes suggested the propriety of opening communications with all the schoolmasters in Scotland, with the view of obtaining information and reports from time to time of any objects of historical interest found in their several districts; and a committee was named for the purpose of carrying out the proposal.

FALL OF A RAILWAY BRIDGE.—The traffic of the line of railway between Coventry and Nuneaton (a branch of the London and North-Western), was stopped on Monday by the falling in of a viaduct at Cowden, a short distance from Coventry. The line from the latter city communicates direct from Leamington with Tamworth, Derby, and the north. The bridge, which is of several arches, is of stone, and carries over the rails a very important old turnpike-road of the district; but, fortunately, at the time the accident occurred, owing to the absence of traffic, not the slightest injury befell either the road or railway travellers.

NEW IRON WORKS AT WORKINGTON AND HARRINGTON.—The Harrington Iron Company are constructing two blast furnaces which, when in full operation, are expected to give employment to about 700 hands, to whom on an average 750*l.* a week wages will be paid. About 1,000 tons of ore will be weekly smelted by this company, and should they commence as ironfounders, the importance of these works to the district will be greatly increased. At Workington a company for the smelting of iron ore has been formed on the principle of limited liability, under the title of the Workington Hematite Iron Company, with a capital of 30,000*l.* The works are to be forthwith commenced.

THE CHURCH OF ST. VINCENT OF PAUL, CORK. —We are asked to say, with reference to our mention of the church of St. Vincent of Paul, that the internal completion of the building, and all the fittings, including benches, stained glass, and a very richly-sculptured reredos and altar, in Caen stone and Irish marbles, has been carried out under the direction of Messrs. Weightman, Hadfield, and Goldie, architects.

IRRIGATION OF LONDON.—I perceive a manifest spirit for general improvement in every department which is advocated by your publication, which I, in a great measure, attribute to its powerful and legitimate influence. Might I suggest to you the propriety of the general irrigation of London streets and pavements by three o'clock in the morning? So many persons being now out of employ, and the object being a legitimate one, I hope you will urge this point, being so salutary and so becoming the dignity of one of the greatest cities in the world.

W. SHARPE, M.A.

THE ARCHITECTURAL EXHIBITION.—Pressure on our space compels us to postpone the remainder of the Rev. Mr. Petit's paper, a report of a lecture by the Rev. Thomas Hugo, and a further notice of the Exhibition. Next week, with the aid of a supplement, we hope to work off arrears.

GAS AT ASHBOURN.—The affairs of the Ashbourn Gas Company, says the *Derbyshire Advertiser*, show a steady and satisfactory progress. From the annual statement we learn that, while the income for the year ending 29th September, 1847, amounted to the sum of 426*l.* the income for the last six months only, reaches the sum of 450*l.* showing an increase at least of 450*l.* per annum. In 1847 the price charged for gas was 12s. 6d. per 1,000 feet: the present charge is 7s. per 1,000 feet. The directors state their increasing conviction that the day is not very far distant when the price of gas may be further reduced, and the property of the shareholders *thereby* increased in value. At the half-yearly meeting of proprietors a dividend was declared at the rate of 6*l.* per cent. per annum.

LIVERPOOL ARCHITECTURAL SOCIETY. — At the ordinary meeting on the 21st inst. Mr. Huggins in the chair, the secretary announced that Mr. Joseph Pepper, one of the student members, had been awarded the prize of merit in the competition of the students' design. A letter was received from the secretary of the joint-committee appointed to make arrangements for the reception of the Archæological Institute of Great Britain and Ireland in Chester, announcing that the visit of that body would take place in the autumn of the present year, and requested the co-operation of the society in contributing to the success of the meeting. The paper for the evening was read by Mr. H. P. Horner, and its subject was "Architectural Consistency."

IMPROVEMENT OF THE CONDITION OF THE AGRICULTURAL LABOURER. — Some months since the *Sunday Times* offered two premiums of 10*l.* and 15*l.* for the best essay on this subject. We are now informed that the first premium of 15*l.* has been awarded to Mr. T. W. P. Isaac, of Bath, in conjunction with Mr. E. Spender, of the same city; and that the essay contains suggestions for the ventilation, warming, draining, and construction of labourers' dwellings.

SEWERS.—The following tenders have been received for an extension of two sewers at Harrow, about 1850 feet of 18-inch, 650 feet of 12-inch, 430 feet of 9-inch, and 280 feet of 6-inch, with taking up and relaying about 40 feet of old 12-inch pipe sewer:—

Richards	£599 0
Pilbro	550 0
Murray	500 0
Mills and Barrett	495 0
Pedley	457 10
Pound	471 10
Boulton	435 0
Potton	430 15
Thirst	430 0
Woodbridge (accepted)	430 0
Ennor	423 0
Gardner	370 0
Rogers	355 0

THE TIMBER TRADE OF 1856. — The official returns of the Board of Trade show a mean increase of one-fourth, or 25 per cent. on the reduced trade of 1855, as well as a restoration of the equilibrium of the three preceding years. Our London importation appears to have been—

From—	1852. Tons.	1853. Tons.	1854. Tons.	1855. Tons.	1856. Tons.
Norway and Sweden	161,000	227,000	180,000	219,000	175,000
Russia and Finland	60,000	82,000	9,000	300	64,000
Germany	71,000	153,000	82,000	92,000	77,000
Foreign	292,000	462,000	271,000	311,300	316,000
British America	131,000	104,100	221,000	77,000	115,000
Africa, United States, East and West Indies	15,000	11,000	24,000	20,000	17,000
Total	438,000	577,000	516,000	408,000	448,000

On the whole an increase of 10 per cent. compared with the imports of 1855, but 8 per cent. less than the average of the three preceding years, so that the London importation has not been resumed in its full proportion with that of the United Kingdom. The consumption in London is shown to be as follows:—

	Sawn Wood, or Deals, Battens, Boards and Ends. Pieces.	Hewn Wood or Timber square and round. Loads.
1852	6,132,000	170,000
1853	6,896,000	209,000
1854	6,222,000	198,000
1855	6,705,000	181,000
1856	6,731,000	179,000

A NEW MATERIAL.—The *Canadian News* says,—A new building material, called marblized granite, is just now making a great noise. The discoverer is at once a British subject and an American citizen. Headly is his name, and at present he resides in Canada. He was born in England, and, when a child, his father emigrated to the United States. By taking an advantage of the doctrine, "Once a subject always a subject," he is enabled to protect his invention in Canada and England, and by taking an advantage of the United States law, which makes citizens of all who live in that country before reaching their majority, he is enabled to patent it in the United States, where foreign patents are obtainable. It is alleged that this material can be made for one-half the present price of bricks.

TENDERS

For the erection of National Schools, at Yalding, Kent. Messrs. Caveler and Hooker, Architects. Quantities furnished by Mr. W. Coates:—

Sutton and Walter, Maidstone	£1,643 6 6
Harding, London	1,637 5 8
Morgan, Tonbridge	1,449 12 8
Tompson, Maidstone	1,400 0 0
Stevens, East Peckham	1,395 0 0
Porter, Folkestone	1,336 10 0
Wheeler, Tonbridge	1,250 0 0

TO CORRESPONDENTS.

"THE GOVERNMENT COMPETITION."—Am I at liberty to put a *ground* tint over the whole of my plans, to distinguish the respective departments, or the paved and boarded floors? The instructions merely say "the plans to be tinted in light brown Indian ink," which I take to refer to the sectional parts only. I think it would be desirable to know the feeling of the competitors in this matter (being an important one), if some of the leading men would publish their intentions through your Journal. — A COMPETITOR.

"E. T. O." — "W. S." — "R. S. D." (St. Bartholomew's, Smithfield, and the Norman Chapel, in the Tower of London, are both earlier than the earliest part of the Temple Church).—"R. K."—"W. E." — "T. B."—"J. E."— "G. P." — "J. J." — "W. W."—"Mr. A." — "G. M. H." — "J. A. D." — "C. B. A." — "S." — "C. W. W." (we are forced to decline recommending).—"B. B." (ditto).—"F. A." (ditto).—"G. R. C."—"R. B."—"G. P."—"F. G."—"E. R. B."—"W. D."—"W. L." — "Mr. O."—"Rev. E C. A."—"W. H."—"J. B." — "J. P." — "G. B." — "H. A. H."—"Rev. T. H."—"J. E. C."—"M. W. M." — "W. I. J." — "P. and Sons" (we know of no such statement). — "C. W. K." (is in type).—"A Mechanic"—"J. C. A." (for operative carpenters).—"A Builder" (the question has been answered before). — "J. H"—"C. S."—"Smoke-dried" (no pot will answer alike in all cases).—"E. R."

"*Books and Addresses.*"—We are forced to decline pointing out books or finding addresses.

NOTICE. — All communications respecting *advertisements* should be addressed to the "Publisher," and not to the "Editor:" all other communications should be addressed to the EDITOR, and not to the Publisher.

NOTICE TO SUBSCRIBERS.—A title-page in colours for the last volume may be obtained *gratis*, on personal application at the Office, by those who prefer it to that which accompanied the index in the closing number. Covers for the volume may be obtained at the Office, price 2s. 6d. or the Publisher will bind it for 3s. 6d. The complete volume may be obtained, price 21s.

ADVERTISEMENTS.

MEETING of PARLIAMENT. — "The BUILDER," and all the other London newspapers, regularly supplied in town, and punctually forwarded by the morning, evening, and foreign mails, to all parts of the United Kingdom, India, Australia, and foreign countries. ADVERTISEMENTS INSERTED. A List for 1857, with politics, days of publication, &c. sent Gratis.—WM. DAWSON and SONS' Newspaper and Advertising Offices, Anchurch-yard, and 74, Cannon-street, City, E.C.—Established 1809.—Country Booksellers supplied.

THE NEWS OF THE WORLD, Weekly Newspaper—Price, Unstamped, 2d; Stamped for Post, 3d.—Sale, upwards of 155,000 copies weekly. It contains, in addition to all the interesting News of the Week:—Probable Termination of the Persian War—The Cabinet Secret—The Coming Session; Lord Palmerston's Strength and Weakness—Government and the Income-tax — Meeting of Ticket-of-Leave Men — Doctoring our Food—Unemployed Labour in London; Visits to the Police-courts—The Murderer Thomas Mansell—The Murder of the Infants at Walworth—The Great City Forgeries—Horrible Cruelty to an Infant—Child Murder at Liverpool—Neglect of the Suffering Poor—Robberies, Accidents, &c.; and all the Latest News of the Week. It offers immense advantages to Advertisers.—Offices, 19, Exeter-street, Strand.

ILLUSTRATIONS of the SPIRES and TOWERS of the MEDIÆVAL CHURCHES of ENGLAND. Fifty-two fine Plates, folio, with descriptions, 2 vols. in cloth, elegant, published at 6*l.* 6s.; reduced to 2*l.* 15s.
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Therapia Mills, Constantinople, 1st January, 1857.

ARCHITECTS, BUILDERS, ENGINEERS, and SURVEYORS, can be IMMEDIATELY SUPPLIED with COMPETENT ASSISTANTS (temporary or otherwise). Those only recommended whose efficiency and qualifications can be guaranteed. The registry is open to employers, or lists furnished therefrom (free), on application to Messrs. RICHARDS and CO. 4, Trafalgar-square, London.

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TO BRICKMAKERS AND OTHERS.

BRICKMAKING.—The Advertiser, who thoroughly understands the manufacture of all descriptions of bricks in all their branches, having executed and completed extensive contracts during several years past, is now open to treat for CONTRACT, either to find all or part plant and materials. Good reference.—Address, J. B. care of Messrs. Parker and Bell, Land and Estate Agents, Old Kent-road.

FLOOR BOARDS, &c.—R. SLADE begs to inform Builders and the Trade, that he has now on hand a large assortment of FLOORING and MATCHED BOARDING from ¾ inch to 1¼ inches thick, seasoned, and ready for use; also Mahogany, Moulding, Wainscot, and all kinds of Timber required for Building purposes.—Address, R. SLADE (late E. Simms), Flooring Manufactory, Wilton-road, Pimlico.

TO BUILDERS AND OTHERS.

AT the LOWEST PRICES.—TIMBER, DEALS, MAHOGANY, and WAINSCOT. A large assortment of seasoned prepared FLOORING and MATCH-BOARDING of all descriptions. Also an extensive stock of Dry White Yellow, and Pine Cut Stuff, Slating, Battens, Pantile Laths Oak Plank, Sash Cills, &c. Timber of all kinds, Planks, Deals and Battens, fetched from the docks, sawn by patent machinery in the best manner, and delivered at the shortest notice.—THOMAS JACKSON, Sawing and Planing Mills, Commercial-road, Pimlico, London.

ANOTHER GREAT REDUCTION.—Yellow Deals, 3s. 4d; Spruce, from 3s.; Pine Plank, from 3s. 6d.; 2½-inch Yellow Battens, from 12l.; F. Walnut, 8d. per foot; Mahogany, 6d. per foot; Prepared Floor-boards, 13s. 6d. Cartage free to any part of town.—T. FORMAN, 1, Walnut-tree-walk, Lambeth, S.

DRY WAINSCOT, in all thicknesses.—A large Stock, first quality, very dry, at HENRY BATEMAN'S, Timber Merchant, 35, Sun-street, Bishopsgate-street, London.

NOTICE of REMOVAL.—EDWARD SIMMS begs to inform his customers and friends that he has REMOVED his business from Wilton-road, Pimlico, to the KING'S-ROAD, CHELSEA, where their orders will be promptly executed as heretofore.—Please address, E. SIMMS, King's-road, Saw-mills, Chelsea, opposite Manor-street.

AT the LOWEST CASH PRICES.—SAMUEL PUTNEY invites the attention of buyers to his large and well-selected STOCK of DEALS, and the reduced Price of prepared Flooring, &c.

Inch Yellow Flooring	18s. per square.
¾-inch ditto	15s. „
Pine Plank, 12 3 by 12, from	£31 per 120
Yellow Deals, from	20 „
Spruce Deals, from	18 „
Yellow Battens, from	12 „

A List of Prices forwarded on receipt of a postage-stamp
N.B.—All Sawn Goods delivered within two miles free of cartage.
Borough-road, Southwark, and Elm-street, Gray's-inn-lane.

EDWARD SIMMS begs to inform Builders and the trade, that he has now on hand at his manufactory (the first of its kind ever established), a large assortment of PREPARED FLOORS and MATCH BOARDING, seasoned and ready for use, from ¾-inch to 1¼-inch thick, in White or Yellow Deal, Oak, or Pitch Pine. Also Dry Deals, in all thicknesses, Slating Battens, Pantile Laths, Oak Sills, Plank, and Scantlings. Mouldings in clean Pine, to any design. A pattern list forwarded on application.—Address, E. SIMMS, Flooring Manufactory, and Sawing, Planing, and Moulding Mills, King's-road, Chelsea.

EAGLE TIMBER WHARF, Milford-lane, Strand, adjoining the Temple Pier.—W. L. TAYLOR invites attention to his well-selected STOCK of YELLOW DEALS and BATTENS, PINE, and SPRUCE. Prepared Flooring 2-cut Yellow Battens, 14s. per square; inch First Quality White, 18s. per square; Cut Stuff of all kinds, Timber, &c. &c. at Wholesale Prices.

MOULDINGS BY MACHINERY. Capping, Sash-bars, Beads, &c. to any Design, carefully packed and sent to all parts of the Country. A Pattern List sent on application to

E. SIMMS,
SAWING, PLANING, AND MOULDING MILLS,
KING'S-ROAD, CHELSEA.

ST. PANCRAS SAWING, PLANING, and MOULDING MILLS, Cambridge-street, Old St. Pancras-road.—GEORGE NOKES and CO. invite the attention of Builders and the Trade generally, to their STOCK of DRY FLOORING, at the following prices, for cash:—

¾-inch white, 13s. 6d. per square; ¾-inch white, 15s. per square; 1-inch white, 18s. per square; ¾-inch yellow, 15s. per square; ¾-inch yellow, 16s. 6d.; 1-inch yellow, 20s.

Timber, deals, planks, &c. at the lowest remunerative prices. A liberal discount allowed on mouldings for exportation. Book of designs forwarded on application.

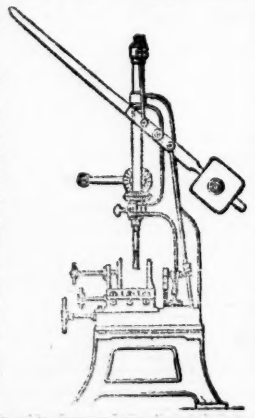
ALFRED ROSLING begs to inform his Customers and the Building Trade generally, that he is enabled to allow a discount of 15 per cent. upon his list prices for Mouldings.—A large stock of dry flooring at low prices.—Southwark-bridge Wharf, Bankside.

ACORN TIMBER WHARF and SAW MILLS,
CANAL BRIDGE, OLD KENT-ROAD, LONDON.
A Monthly Price Current forwarded on application.
RICHARD MAY, Proprietor.

LETT'S WHARF PATENT SAWING, PLANING, and VENEER KNIFE-CUTTING MILLS, Commercial-road, Lambeth. The Proprietors beg to announce to the Trade that they have completed their extensive arrangements, and will be happy to execute all orders entrusted to their care with despatch and punctuality. Wet and dry docks, and powerful cranes for landing heavy goods, offer facilities not to be obtained elsewhere.

A LARGE ASSORTMENT OF SEASONED PREPARED FLOORING, MATCH BOARDING, &c. &c. ALWAYS IN STOCK AT REDUCED PRICES.

NEW PATENT MACHINE for MORTISING and TENONING HARD or SOFT WOOD and BORING WOOD or IRON.



House and Coach Builders, Joiners, Cabinetmakers, and others, doing similar work, are invited to call at the Patentees', POWIS, JAMES, and Co. Wholesale Builders and Cabinet Makers, Ironmongery Establishment, 26, Watling-street, City, and see in action this very simple, powerful, and expeditious machine, which is the only one yet brought out, for performing these three separate kinds of work by one machine; and as it is self-feeding, it does not require any skill or care in using like the older inventions introduced. It can either be worked by a boy, or made to go by steam power.

P.S. Steam Engines and Machinery contracted for.

WM. BOOTH, CITY CENTRAL SAWING, PLANING, and MOULDING MILLS Whitecross-street, St. Luke's.

AUSTIN'S IMPERIAL

PATENT SASH and BLIND LINE can be obtained of all
COPPERSMITHS, IRONMONGERS, MERCHANTS, FACTORS, and WHOLESALE HOUSES, in TOWN or COUNTRY.
Established 1774.

SMOKY CHIMNEYS.—The best Cure is KITE'S PATENT ALBERT CHIMNEY-CAPS, patronised by Her Most Gracious Majesty—200 on Buckingham Palace; on St. James's Palace, Claremont, Windsor Castle, Ordnance Departments, Government Offices, Public Buildings, &c. Also extensively adopted by the Nobility, Gentry, and the Public in general. Wrought iron, 25s.; Galvanised do. 30s.; Cast-iron, 35s. each; the latter as durable as the building itself. The merits of this invention are proved by practical experiments; they are likewise architectural in appearance.—Depôt, Barton's Iron Works, and Manufactory for the Patent Stable Fittings, and Enamelled Mangers.—Address JAMES BARTON, 370, Oxford-Street, London.

GALVANIZED WIND-GUARDS.

No. 1. 3 feet high, 14 in. by 9 in. bottom, 18s.
No. 2. 4 „ „ „ „ „ 20s.

A DISCOUNT ALLOWED TO THE TRADE.

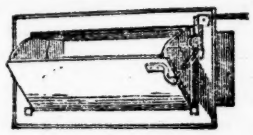
This Windguard is highly recommended by the Manufacturers,

F. EDWARDS, SON, and CO.
42, POLAND-STREET,
OXFORD-STREET.

FOR HIRE, a SPACIOUS TENT, adapted for the Laying of Foundation Stones for Public Buildings, &c.
Also, for Sale, a Quantity of Cocoa Matting for Churches, at greatly reduced prices.
Apply to H. PIGGOTT, 115, Fore-street, City.

VENTILATION.—PURE AIR.

Sheringham's Ventilator for the admission of pure air through an



EXTERNAL WALL.

With single pulley, from 6s. each; with leading pulley, from 8s. 6d.

These Ventilators are arranged that the requisite quantity of air may be admitted for the due ventilation of an apartment without the slightest draught being felt by the occupants; and as they are placed in the external wall, their action is not impeded when the house is closed for the evening, at which time a constant supply of fresh air is most required.—HAYWARD, BROTHERS, sole Manufacturers, 196, Blackfriars-road, and 117, Union-street, Borough; and of all respectable ironmongers, builders, &c.

TO BE SOLD, at a reduced price, in consequence of death, TWENTY-FOUR CARVED OAK DINING-ROOM CHAIRS, covered in best morocco leather; to be seen at Hull's Gothic and Elizabethan Oak Furniture Manufactory, 109, Wardour-street, Oxford-street. At the same establishment will be found several carved oak sideboards, sets of dining-tables, dinner waggons, &c. all of the best manufacture and well seasoned.

OIL PRESSES.—WANTED, some SECOND-HAND powerful PRESSES, adapted for pressing seeds, fish, or other similar matters.—Address, with lowest cash price and description, to A. 28, Clapham-road-place, Kennington.

SUPERIOR DRAWING INSTRUMENTS (New and Second-hand) at very reduced prices, at SUFFELL'S, 132, Long-acre, London, W.C. Every instrument requisite for engineers, architects, surveyors, contractors, and draughtsmen warranted. Measures and scales of all nations forwarded to all parts, on the receipt of remittance, or London reference.

IMPORTANT to the ENGINEERING PROFESSION.—SAFE and RAPID TRANSMISSION of DOCUMENTS.—Plans, Deeds, Law Papers, Samples, and Articles for private use, &c. forwarded daily at THREE p.m. to all parts of the Continent, with the Mails throughout, by the "CONTINENTAL EXPRESS PARCELS AGENCY," of which the proprietors are the sole correspondents of the Royal Prussian Post-office, the Belgian Government Railway, and agents of the mail packets between Dover and Ostend. Rates fixed and moderate, tables of which, with every information, to be had gratis, on application at the Chief Office, 53, Gracechurch-street, London.

N.B. Parcels to be sent the same day must be at the Chief Office by THREE p.m.

PATENT SOLID SWISS PARQUETERIE. This beautiful, unique, economical, and elegant description of Flooring, so extensively used in Paris and other continental cities, is now introduced into this country; an extensive assortment of specimens and patterns commencing at 1s. per foot super. together with every particular of its cost and adaptation, can be obtained of Messrs. H. P. BURT and CO. 2, Charlotte-row, Mansion-House; or of Messrs. ARROWSMITH and CO. 80, New Bond-street.

MR. W. S. WOODIN'S OLIO of ODDITIES, with new costumes and various novelties, vocal and characteristic, EVERY EVENING (Saturday excepted), at EIGHT. A Morning Performance every SATURDAY, at THREE. Private boxes and stalls may be secured, without extra charge, at the Box-office, Polygraphic Hall, King William-street, Charing-cross. The hall has been entirely redecorated.

ROYAL POLYTECHNIC.—On Monday, February 2nd, at Eight, the first of the Tenth Course of Lectures to the Industrial Classes, by J. Passmore Edwards, Esq. "On Transportation, and the Ticket-of-Leave System."—New Lecture by J. H. Pepper, Esq. "On Optical Illusions," with very curious experiments, every Wednesday and Friday, at Three and Eight.—Lecture by Mr. G. A. Cooper, "On Priestley's Patent Pianoforte."—Entire New Series of Dissolving Views, illustrating the "Traveller's Portfolio," daily, at Two.—Second and most costly Series of Dissolving Views, illustrating "Blue Beard," with humorous and original description by Leicester Buckingham, Esq. daily, at Four and Nine.—Re-engagement of August Fairbairn, Esq. and the Misses Bennett, for their Scottish Musical Entertainments, every Tuesday, Thursday, and Saturday Evenings, at Eight.—Admission to the whole, 1s.; Children and Schools, half-price.

TO BUILDERS.—The NATIONAL PROVINCIAL PLATE-GLASS INSURANCE COMPANY (37, Ludgate-hill) allows a liberal commission for the introduction of business. THOS. DRAKE, Secretary.

SPECIAL NOTICE.

TO SECURE THE ADVANTAGE OF THIS YEAR'S ENTRY, PROPOSALS MUST BE LODGED AT THE HEAD OFFICE, OR AT ANY OF THE SOCIETY'S AGENCIES, ON OR BEFORE THE 1st OF MARCH.

POLICIES EFFECTED ON OR BEFORE 1st MARCH, 1857, WILL RECEIVE SIX YEARS' ADDITIONS AT THE DIVISION OF PROFITS AT 1st MARCH, 1863.

THE SCOTTISH EQUITABLE LIFE ASSURANCE SOCIETY.—Instituted 1831.

At the Division of Surplus, at 1st March, 1856, a Policy for 1,000l. effected at 1st March, 1832, was increased to 1,571l. 18s. 10d. being at the rate of Two and a Quarter per Cent. per Annum on the sum assured. This addition may be converted into a present payment, or applied in reduction of the future premiums.

Profits are divided triennially, and belong wholly to the assured.

Accumulated Funds	£1,000,000
Annual Revenue	169 400
Existing Assurances	4,764 949

Copies of the Report by the Directors on the division of surplus in 1856, and all information, may be had on application at the Head Office, or Agencies.

ROBERT CHRISTIE, Manager.
WILLIAM FINLAY, Secretary.
Head Office—26, St. Andrew-square, Edinburgh.
Office in London—26 Poultry, E.C.
ARCHD. T. RITCHIE, Agent.